

UNITED STATES OF AMERICA
U.S. NUCLEAR REGULATORY COMMISSION

THE 23RD ANNUAL REGULATORY INFORMATION
CONFERENCE

MARCH 9, 2010

8:30 A.M.

TRANSCRIPT OF PROCEEDINGS

Before the U.S. Nuclear Regulatory Commission:

Gregory B. Jaczko, Chairman

Kristine L. Svinicki, Commissioner

George Apostolakis, Commissioner

William D. Magwood, IV, Commissioner

William C. Ostendorff, Commissioner

APPEARANCES

Charles "Chip" Pardee, Chief Operating Officer, Exelon
Generation Company

Anthony Pietrangelo
Senior Vice President and Chief Nuclear Officer, NEI

NRC Staff:

Eric Leeds
Director, Office of Nuclear Reactor Regulation

Brian Sheron
Director, Office of Nuclear Regulatory Research

Martin Virgilio
Deputy Executive Director, Reactor and Preparedness
Programs, NRC/OEDO

1 PROCEEDINGS

2 MR. LEEDS: All right. Good morning, and welcome to the second
3 day of the 23rd Annual Regulatory Information Conference. For those of you just
4 joining us, my name is Eric Leeds; I'm the director of the Office of Nuclear
5 Reactor Regulation. And for those of you that have been participating in the
6 conference, I want to thank everyone for their insightful questions, as well as
7 your very positive and constructive feedback that we've received on the
8 evaluation forms. So I want to urge everyone to continue sending your questions
9 up, and please, continue to provide us with feedback. We really appreciate it.

10 Now, a few quick housekeeping reminders before we get started
11 with this morning's agenda. Please remember to visibly display your name
12 badges throughout the conference, please turn off or silence all of your electronic
13 devices. All items that are left behind in the conference area or in the meeting
14 rooms will be given to the hotel bell staff in the hotel lobby, and a reminder that
15 all presentation materials will be posted on the NRC website at the conclusion of
16 the conference.

17 Now, to kick off this morning's meeting, I'd like to introduce the
18 NRC's -- one of NRC's newest members of the Commission, Commissioner
19 William Magwood. Commissioner Magwood began his service on the
20 Commission in April of last year. Before coming to the NRC, Commissioner
21 Magwood served seven years as the Director of Nuclear Energy with the U.S.
22 Department of Energy, where he was the senior nuclear technology official in the
23 United States government, and the senior nuclear technology policy adviser to
24 the Secretary of Energy. He oversaw the restoration of the Federal Nuclear
25 Technology Program, and led the creation of Nuclear Power 2010, Generation 4,

1 and other innovative initiatives, including efforts that help reverse the decline in
2 American nuclear technology education. After his DOE service, Commissioner
3 Magwood founded and headed the Advanced Energy Strategies, a company that
4 provided strategic advice to domestic and international organizations. Prior to his
5 appointment at the Department of Energy, Commissioner Magwood managed
6 electric utility research and nuclear policy programs at the Edison Electric
7 Institute in Washington, D.C. Commissioner Magwood holds a B.S. degree in
8 physics and a B.A. degree in English from Carnegie Mellon University. He also
9 holds a Masters of Fine Arts degree from the University of Pittsburgh. Please
10 join me in welcoming Commissioner Magwood.

11 [applause]

12 Sir, I adjusted the podium to fit you, sir.

13 COMMISSIONER MAGWOOD: [inaudible]. You got it right, too --
14 very good. Good morning. Well, it's a true pleasure to be here for my first RIC --
15 and let me stress this is my first RIC -- I've never actually been to the RIC before,
16 but I've heard good things about it. One thing that has proven to be absolutely
17 true is a lot of people come here, and I welcome all of you -- especially those of
18 you from overseas who join us today, I welcome those of you from Agreement
19 States, the many licensees, many stakeholders, and other guests who are here
20 today. My thanks, as other commissioner thanks [spelled phonetically], Brian
21 [spelled phonetically], and Eric, and their staffs for assembling this conference.
22 I'm truly impressed with the professionalism which you've brought to this. And I'd
23 also like to give a special thanks to my staff -- many of whom are here today in
24 the audience. If I name them, I'll miss somebody, but Patty [spelled
25 phonetically], Bill, Rebecca, Carrie [spelled phonetically], Molly, the other Patty --

1 [laughter]

2 -- if I missed you, hold your hand -- okay, I haven't missed anybody.

3 And of course, there's other people I've worked with. I see Audrey [spelled
4 phonetically] in the audience, hopefully Bernice [spelled phonetically] is out there
5 somewhere, Tyson [spelled phonetically] -- so many people I've worked with -- I
6 really appreciate your support over the last year. It's been a true pleasure
7 working with you. Now, whenever you're -- whenever you start the second day,
8 and particularly if you're the fourth commissioner to speak, you have a little bit of
9 a problem, because you recognize that by now everything has already been said
10 that needs to be said by the commissioners. And, you know, the chairman gave
11 a very comprehensive overview yesterday, Commissioner Ostendorff gave the
12 perspectives of a commissioner in his first year, and he and I agree on a lot of
13 issues, so there really wasn't much to add to that. Commissioner Svinicki
14 already told the neutron joke, so --

15 [laughter]

16 -- so I was left with -- well, what do I say at this point? What do I
17 add to all this? And I thought, well, maybe what I should do is talk about
18 something that people really weren't expecting to hear about today. So I thought
19 I would talk about NASA. Now, the reason I thought about NASA was -- I was
20 thinking about -- you know, if you ask people, "What was the single most
21 successful technology organization in the post-World War II era?" it would be
22 very surprising if most people didn't answer NASA. When President Eisenhower
23 signed the National Aeronautics and Space Act in July 1958, the U.S. space
24 effort was little more than an afterthought. However, by 1970, NASA had
25 developed and deployed technology in the Mercury, Gemini, and Apollo

1 programs. By the time Apollo ended in 1972, seven -- 12 NASA astronauts had
2 visited the lunar surface. [unintelligible] Apollo [spelled phonetically] immediately
3 raised significant questions about America's next ventures into space -- but
4 Skylab, the shuttle, and the International Space Station eventually followed.

5 Along the way, NASA's unmanned science missions expanded
6 human knowledge. Despite these successes, however, the political consensus
7 that propelled the incredible progress in NASA's earlier years had fragmented.
8 The orbiter Atlantis will fly the very last shuttle mission this June, and there are
9 many unanswered questions about what comes next. Now, well, certainly, you
10 know, it'll always be nice to work with NASA because you get to put pictures up
11 like this, but since I had the opportunity to put this picture up, I did it anyway -- it's
12 just kind of a cool picture. And while pictures like this and NASA's
13 accomplishments certainly captured the imagination of a generation, there is
14 another organization which experienced a similar trajectory of success.

15 When President Eisenhower signed -- ushered the Atoms for
16 Peace Era, the organization that was charged to implement his vision was the
17 Atomic Energy Commission. In the 20 years in [spelled phonetically] 1970, the
18 AEC developed and deployed a series of successful liquid metal reactors, gas
19 reactors, gas-infusion enrichment plants, and pure [unintelligible] processing refill
20 [spelled phonetically] facilities, just to name a few accomplishments. And, by the
21 way, in its spare time the AEC commercialized whitewater reactor technology in
22 the United States. Somewhat like NASA, in the 1970s, things began to change.
23 Important work continued, but the political winds had shifted. Whereas NASA
24 had to deal with life after Apollo, the AEC had to adjust to changing political
25 attitudes toward nuclear energy and the power of the AEC itself.

1 The AEC became increasingly embattled as it engaged in losing
2 wars over radiation standards, thermal pollution, and its application of National
3 Environmental Policy Act. A child of the Cold War, the AEC's diverse missions
4 inculcated a culture of secrecy that was ill-suited to the challenge of overseeing
5 commercial nuclear activities in the America of the early 1970s. Eventually, after
6 considerable debate, Congress passed the Energy Reorganization Act,
7 separating regulatory and promotional functions of the AEC. The promotional
8 side of AEC was managed first by Energy Research and Development
9 Administration, and later by the Department of Energy. These organizations left
10 the Commission structure behind, and were led by a more standard politically-
11 appointed leadership structure. They inherited AEC's massive infrastructure, and
12 for many years pursued the technology [unintelligible] out in the 1960s --
13 principally, the development of advanced liquid metal reactors and recycling
14 technologies.

15 Much of this work culminated under the Integral Fast [spelled
16 phonetically] Reactor Program. While [unintelligible] in many areas followed
17 between 1990 and 2010, the salient technology decision in this period was the
18 termination of large-scale U.S. efforts to develop fast reactor technology. Many
19 questions about the future remain, but today I'm very, very pleased that my friend
20 Pete Lyons [spelled phonetically] is now at the helm to lead the organization
21 forward. And Pete had his confirmation hearing yesterday, and I heard it was
22 just a fantastic experience, so Pete, congratulations and best wishes to you.

23 Now, there are lessons to be drawn from this history -- these are
24 some reflections as we embark on a new era. First, I observe the progress made
25 by AEC and NASA prove to be highly reliant on a strong and consistent political

1 consensus. Unfortunately, such consensus are much harder to build and
2 maintain today than was possible at the height of the Cold War. Strong support
3 in Congress and the public made it possible for these agencies to spend billions
4 of dollars each year, apply the country's most talented scientists and engineers,
5 and obtain whatever natural resources were needed to accomplish the missions.
6 Once the support waned, missions changed and evolved to adjust, groping for a
7 formula to move forward as best as possible under the circumstances. In this
8 way, the strategies adopted and the decisions made by managers often were
9 influenced by what seemed to be politically acceptable. Ironically, this only fed a
10 perception among policymakers and stakeholders that the projects promoted by
11 these agencies were not rooted in the best science, and were therefore of limited
12 value.

13 The Nuclear Regulatory Commission in large measure successfully
14 avoided this vicious cycle. Even when policymakers and stakeholders agree --
15 disagree with [unintelligible] made by NRC, they rarely question the motivation or
16 technical quality of those judgments. NRC emerged from the fission of the AEC
17 as a focused, single-mission agency that reflected the transparency of decision-
18 making that the public demanded. Of all its attributes, none has been more
19 important to its success than its independence as an agency. NRC's decisions,
20 methods, plans, and approaches are not policies to be negotiated in political
21 arenas. While the courts and Congress, through their legislative powers, have
22 the final say in any matter, we at NRC are free to conduct our work while basing
23 our actions on the scientific and technical facts [spelled phonetically] as we find
24 them, the laws and precedence as we interpret them, and the overarching
25 mission to protect health and safety and public we serve.

1 As an example, I can reflect on the 1990s as a time when many
2 experts in this country dismissed the idea that nuclear energy had a viable future
3 in the United States. The debate of the day focused on a likelihood of nuclear
4 plants becoming stranded assets -- too expensive to operate, and likely to
5 become a crushing financial burden on the companies that owned them. Far
6 from any discussion on new construction, few believed that nuclear plants would
7 be relicensed, including the government's own Energy Information
8 Administration. During this period, DOE's nuclear technology research funding
9 evaporated, and eventually reached zero in 1998 -- which, by the way, was when
10 I took over. It was a lot of fun at that time.

11 [laughter]

12 Now, as you can see in this chart, EIA was projecting that by 2015
13 we were down 49 units and 37 gigawatts -- though, you know, the future isn't
14 quite what they projected at the time. During this very challenging period, the
15 NRC [unintelligible] three processes. The agency implemented more effective
16 regulation of nuclear plants, established the requirements for relicensing that no
17 one thought would happen, and established the modern process for licensing
18 new plants. The NRC, in point of fact, launched a host of groundbreaking
19 decisions that would have been inconceivable if not for the agency's
20 independence from both nuclear skeptics and nuclear proponents. That's not to
21 say the NRC has not been buffeted by events.

22 The accident at Three Mile Island had an immediate and massive
23 impact on the nation and NRC. The American people demanded a strong
24 regulator after TMI, and the government responded accordingly. Oh, there we
25 are. [laughs] The agency staff grew by 50 percent in the five years after TMI,

1 and later came revelations concerning Millstone Unit 1 and their aftermath. The
2 very public revelation of bad management practices at that plant and NRC's
3 inadequate response was a major embarrassment for the agency. The General
4 Accounting Office assessing NRC's performance at the time made this searing
5 comment: "NRC does not have an effective way to quantify the safety of plants
6 that deviate from approved designs or violate regulations. Determining a plant's
7 safety condition is therefore a subjective judgment." I can only imagine what
8 NRC officials felt when they heard that for the first time. I don't know if there's a
9 harsher comment that can be made about a nuclear regulator.

10 Obviously, this led to a significant amount of soul-searching at
11 NRC, and it also fed frustration by powerful members of Congress, such as Pete
12 Domenici of New Mexico. Senator Domenici began to believe that NRC was
13 simply not an effective, predictable, or consistent regulator. He threatened to
14 slash the NRC budget by a third unless he saw improvements. Even today,
15 members of the staff recall those times as a near-death experience. Sometimes,
16 however, near-death experiences are a good thing. The agency that emerged
17 from these difficulties was a better, smarter organization than the one that
18 spawned from the AEC's Division of Licensing and Regulation. I congratulate
19 and thank Chairman Jackson, Chairman [unintelligible], Chairman Diaz, and
20 Chairman Klein and the commissioners who served with them for their vital
21 leadership in managing this change and bringing about this agency's current
22 state of excellence.

23 As I approach the end of my first year as an NRC Commissioner, I
24 am pleased to say that I am very impressed with this agency, its fantastic staff,
25 and the way it does business. I'm also very proud to work alongside my

1 colleagues on the Commission, Chairman Jaczko, Commissioner Svinicki,
2 Commissioner Apostolakis, and Commissioner Ostendorff as we grapple the
3 myriad complex issues facing the agency. The American people are indeed
4 fortunate to have such exceptional people serving their interests. In fact, the
5 American people are very fortunate to have the 4,000 people of the NRC who are
6 wholly vested and passionate about the mission of protecting the health and
7 safety and security of the American people. I see this on a daily basis. I'm also
8 pleased to say that the Commission structure serves us very well. While no
9 strategy is without its flaws, the Commission structure both reflects the broad
10 policy direction of elected government, and preserves the vital independence and
11 credibility of the [unintelligible] work of the NRC. Our structure also fosters the
12 development of a highly professional technical staff, and very stable long-term
13 planning, both of which are much more difficult to achieve in the standard agency
14 governance model. It occurs to me that other federal agencies could benefit from
15 such a structure.

16 That said, we are entering a new era in the United States, an era
17 that holds much promise, but also much uncertainty. I suspect the differences
18 between 2011 and 2051 will be far greater than the differences between 2011
19 and 1971. Changes in the global landscape, in technology, as well as many
20 social, economic, and security issues, will present a host of challenges to the
21 NRC as it considers a future that may not only include the operation and
22 Generation 3+ [spelled phonetically] reactors, but the continued operation of
23 existing reactors longer than we had imagined earlier. In this era, we may see
24 the first new plants built in the United States based on overseas designs. We
25 may see the advent of small modular reactors. We may see new technology

1 [inaudible] the reduction [spelled phonetically] of [unintelligible] isotopes. We
2 may see the long-term storage of spent nuclear fuel. Beyond all this may be
3 further advances in technology that we cannot predict at this time. Whatever the
4 future holds, we must be prepared and we must adapt to the changes ahead
5 without waiting for the next Millstone or the next near-death experience. As I've
6 considered these future challenges, I've asked myself how NRC might continue
7 to evolve to meet the challenges ahead. While I think we're an excellent
8 regulator, I believe the lessons of the past provide some clues. For today's
9 discussion, I highlight three general areas for potential change for consideration:
10 the structural, regulatory, and communications areas.

11 First, the structural. As I've discussed, the NRC's independent
12 status is elemental to its success. It's likely that in the flux and change ahead,
13 this independence will come under increasing pressure. While it's left to
14 responsible individuals in government to protect that independence, there are
15 additional measures we can consider. It's been decades since the last significant
16 revision in the Energy Reorganization Act, and while it has served us
17 exceptionally well, it is my opinion that the time may have arrived when a review
18 of this legislation could be considered. A particular interest to me is NRC's
19 relationship vis-à-vis other elements of the government. While we continue to
20 assert our independence with regard to CAQ requirements, for example, the
21 debate within the government never ceases. And what might Congress's
22 judgment be concerning the role of the Office of Management and Budget in our
23 budget formulation? It would be difficult to argue that OMB should have no role
24 in approving NRC's budget requests for programs outside the fee base [spelled
25 phonetically], but it might be interesting to explore Congress's opinion regarding

1 programs within the fee base.

2 Another item that might benefit from additional clarity is the
3 operation of the Commission itself. While I believe that Congress's expectations
4 associated with the Commission are documented in legislative history, it's too
5 easy to assert multiple interpretations. I think it also would enhance the
6 organization if the law provided additional guidance regarding the responsibility
7 of key officials, particularly the Executive Director of Operations, the Chief
8 Financial Officer, and General Counsel, and what their roles are independent of
9 the Commission. The proper execution of these roles is -- are absolutely
10 essential to the effective operation of this agency, and it's vital to ensure that
11 those officials have all the tools and [unintelligible] they need on a consistent and
12 ongoing basis, now into the future.

13 Finally, it may be appropriate to consider a model for the Office of
14 the General Counsel to further enhance the independence of the organization,
15 ensuring the legal quality of the agency's work, and providing advice for the
16 Commission and staff. Next, we should also -- we should consider ways to
17 further develop performance-based risk-informed regulation. There has been
18 considerable discussion in this conference regarding the IAEA-sponsored
19 Integrated Regulatory Review Service Mission Report on U.S. nuclear safety
20 regulatory framework. I personally appreciate the tremendous effort put forth by
21 the IRRS team and the very comprehensive report they provided. While I did not
22 agree with all of the team's conclusions, I found the entire report very well
23 prepared, and very thought-provoking.

24 One IRRS [spelled phonetically] observation in particular caught my
25 attention. The team noted that the absence of a direct legal statement about the

1 prime responsibility for safety, the NRC must take action to ensure that licensees
2 assume safety responsibility. When I first heard this comment, I resisted the
3 suggestion that there's any question that the NRC -- that not the NRC and not
4 our licensees [spelled phonetically] is responsible for nuclear safety in this
5 country. I've long believed that the model that we should have is one where
6 licensees were responsible for safety and NRC confirms safety. However, the
7 more I thought about this over the last several months, the more I wonder
8 whether we've created a culture in which the NRC has, in effect, taken on more
9 of the responsibility, and left licensees increasingly in a position responding to us.
10 When presented with the innovative approach to improve operations, is a plant
11 manager's first reaction, "How does this improve safety?" or is his first reaction,
12 "What will NRC say?"

13 To the degree that the latter response appears first, I have to
14 wonder whether this is a sustainable regulatory approach. How can we be a true
15 performance-based regulator if we are directly or indirectly making the safety
16 decisions? While we talk of risk-informed regulation, do we not still have any
17 actions that are deterministic and at least arguably subjective? How many
18 inspections lead to non-trivial changes at plants in pursuit of relatively minor
19 improvements in safety and security? How many plants make changes simply to
20 avoid an elongated discussion with the NRC? What are the safety
21 consequences of the actions not taken while plants pursued the actions we tell
22 them to take? One hears echoes of GAO's 1998 assessment in these questions.
23 Now, let me stress, these are questions -- these are not conclusions. I think
24 NRC's an excellent regulator and is doing a fantastic job. But I think these
25 questions should be asked to challenge us as we look to the future.

1 Now, I hasten to add there's a law of conservation responsibility. If
2 NRC is to become a more performance-based regulator, then licensees must
3 become more proactive. We hear a lot about the cumulative impact of
4 regulations on licensees in recent months, but we hear a lot less about the
5 cumulative risk of plant conditions. You can't have one without the other.
6 Further, while I appreciate the nuclear utility industry's voluntary efforts, I note
7 that some plants go much further than others within those efforts. In the
8 voluntary effort, for example, to address the concerns about buried pipes and
9 groundwater issues, there are a wide range of industry responses. While I
10 recognize not all licensees will find the need to follow the Oyster Creek example
11 regarding underground pipes, I hope at least licensees all take note. There are
12 many questions. At bottom I wonder whether a more extensive use of
13 probabilistic [spelled phonetically] risk-assessment might be the past and future.
14 In that I fully support the chairman's recent remarks regarding the need to
15 develop the infrastructure for level three PRAs. And George, if you come up and
16 say the same thing, that'll be three, so we'll be in good shape.

17 [laughter]

18 Perhaps investments in this area will allow us to objectively
19 determine plant safety and security on a continuous basis, allowing licensees
20 greater flexibility and choice as they meet NRC-determined standards for overall
21 plant safety. That may sound favorable from an industry perspective, but the
22 corollary must be -- may be a harsher regulatory response for plants that do not
23 meet those expectations. Finally, it's clear that the problematic communication
24 with the public was one of the factors that consigned the mighty Atomic Energy
25 Commission to the pages of history. At NRC we strive to be a better servant to

1 the public by making as much information available as possible. The culture of
2 NRC is a culture of openness. Unfortunately like many organizations in and out
3 of government, we continue to struggle when it comes to communicating
4 complicated scientific and technical information to the public.

5 I held a public meeting in Braidwood, Illinois last year and found
6 that very well-informed and sophisticated participants in the public did not have a
7 clear understanding of what the EPA drinking water standard meant, where it
8 comes from, and how it's used. We spent several minutes reviewing the
9 background, and several people thanked us, knowing that after years of public
10 meetings, that was the first time that NRC officials had really explained to them
11 what this really -- what this meant. We really have to do a better job. We cannot
12 be successful in our mission to protect the public if the public doesn't know what
13 we're talking about, especially if we leave the impression that we don't care that
14 they don't know. When new health and safety issues arise, as they inevitably
15 will, it's often too late to close the gap, at least not with credibility. We can't
16 surrender this ground. We should perhaps find a way to bring the public
17 stakeholders, including representatives from interested NGOs, into the
18 conversation about how we can communicate more effectively. I've often
19 thought that government organizations should have advisory committees who
20 review and comment on public communications.

21 I think this is a problem that also goes to the need to educate the
22 public on complex concepts such as risk and radiation effects. While it seems
23 that many of us in government and industry have talked about this for decades,
24 we continue to miss the mark. The issues facing us in the future become more
25 complex -- not less. Having a meaningful public debate on issues related to

1 nuclear safety means assuring that interested members of the public have a full,
2 accurate, and credible information and background on these issues. Whether
3 addressing this role as a role for the NRC, the Department of Energy, industry,
4 NGOs, or all the above, it's a challenge that affects everything that we do. I hope
5 we prove able to evolve to meet the next steps ahead. The NRC is an excellent
6 organization that has successfully adapted to many changes over many years,
7 but the global changes facing us now are far more difficult to predict and far more
8 complex to manage than anything that's come before and it's absolutely vital that
9 we stay ahead of the curve. With that, I thank you for your attention, and best
10 wishes for continuing with the rest of the conference today. Thank you very
11 much.

12 [applause]

13 MR. LEEDS: All right, Commissioner [spelled phonetically]. Is this
14 microphone on? Yeah, it's good. All right, Commissioner, we received a number
15 of questions from the audience. If I can begin -- to begin with, Commissioner,
16 you described your impressions of the Commission and the staff. Could you
17 please provide your views and impressions of the regulated industry?

18 COMMISSIONER MAGWOOD: Well, I think the regulated industry
19 -- and of course, this is a very broad group -- we have both the reactor licensees
20 and the materials licensees, we have a lot of different types of businesses that
21 we regulate. I find that licensees as a general matter want to do the right thing,
22 and they're striving to do the right thing. I think that sometimes the processes
23 and discussions with NRC get very complicated and can lead to some
24 misunderstandings, but I think we do a good job of trying to sort that out. So I
25 look at the licensees as people of goodwill trying to do the right thing, trying to

1 manage their operations in a very difficult environment, and so I look at them
2 very positively. That said, you know, we both have roles in this process. Their
3 role is to try to operate their facilities. Our role is to try to make sure that those
4 facilities are operated within guidelines. And there's a natural tension there, of
5 course, and I think that's appropriate. So, I guess I would simply say I have a
6 very positive view.

7 MR. LEEDS: Thank you. All right, Commissioner Magwood, a lot
8 of accolades have been given out to the staff's efforts for the development of a
9 Safety Culture Policy Statement. However, a policy statement without a clear
10 view of how the NRC intends to implement it raises significant concerns within
11 the nuclear industry. What is your view on how the policy statement should be
12 implemented?

13 COMMISSIONER MAGWOOD: Well, I think that to some degree
14 that may misunderstand how a policy statement like this should be reviewed
15 [spelled phonetically]. There's two answers to that -- first, I think the policy
16 statement stands on its own. I think it's a communication from the Commission
17 to licensees, to staff, to all stakeholders, as to what the expectation is regarding
18 safety culture. Safety culture is, in some sense, the single most important issue,
19 I think, that faces us, because in the absence of a good safety culture, regulation
20 simply doesn't work very well because you can't regulate people on a minute-by-
21 minute basis, you have to expect that they'll behave in a way conducive to high
22 levels of safety. However, there are things we can do to implement the Safety
23 Culture Policy Statement, and I think that we're -- you will hear soon some of the
24 thoughts that the Commission and the staff have about that. This is an ongoing
25 conversation within the agency. I do think that there are some things that we are

1 doing now that are reflective of the Safety Culture Policy Statement. So, more
2 discussion on this as we go forward -- I don't think it's something that the industry
3 should be concerned about as a negative. I think it's a positive, and I look
4 forward to the conversation.

5 MR. LEEDS: Thank you. Commissioner, we've received a number
6 of questions on Yucca Mountain. I'm just going to select one that's
7 representative. The question reads, "Delay in NRC action on the DOE motion to
8 withdraw the Yucca license is over 250 days. Uncertainty about the decision is
9 hurting the industry and public. Can you please provide your perspectives on the
10 Yucca Mountain issue?"

11 COMMISSIONER MAGWOOD: Well, I think as Commissioner
12 Ostendorff may have mentioned yesterday, this is an ongoing adjudicatory
13 [unintelligible] within the Commission, so there's very -- there's a limit to how
14 much we can say about it. I would say, however, that the Nuclear Regulatory
15 Commission's judgment on this is simply one element of the process. You know,
16 as you've already discussed yesterday, there's also a court case that's
17 underway, and there's certainly other discussions taking place within the
18 government. So, you know, I don't think here's much that I can add to that,
19 simply to say that, you know, we'll never -- we are working actively within the
20 Commission to talk about this issue -- it has not gone away, it has not died on the
21 vine. It's an active conversation, and that's as much as I can say about it.

22 MR. LEEDS: Thank you, sir. The next question: China appears to
23 be implementing U.S. technology quicker than the U.S. can deploy it. How can
24 the NRC and the industry improve to shorten the nuclear power plant deployment
25 cycle?

1 COMMISSIONER MAGWOOD: Well, first, you know,
2 congratulations to China for being so efficient that they can rush ahead of us with
3 AP1000 technology. That's not a negative on our side; that's a positive on their
4 side. I've often heard this question from people about why it takes so long to do
5 things, to get nuclear technologies licensed in the United States, and so long to
6 build facilities -- recognize that when a nuclear facility is built, it can be in -- a
7 nuclear power plant is built, it'll be in operation for 40, 60, perhaps longer, years.
8 Taking the time up front to get it right, to move methodically, to answer the
9 questions, to make sure that everything is done correctly is a very, very small
10 investment in that context. So, I'm not -- while I recognize that as we go forward,
11 we become more efficient, we'll be able to license things faster, especially once
12 we have design certification for various technology. I'm not uncomfortable with
13 where we are, so I will not apologize for how long it's taken to do this.

14 MR. LEEDS: Thank you, sir. With regard to the cumulative effects
15 of regulation, we understand that the Commission directed the staff to look at this
16 issue. What is your view of the progress?

17 COMMISSIONER MAGWOOD: I'm sorry, what was the last part?

18 MR. LEEDS: What is your view of the progress?

19 COMMISSIONER MAGWOOD: Oh. No, the staff has a proposal,
20 and as you heard, that will be released soon. I think it's a step in the right
21 direction. But I think this is a much more complex issue than we've had good
22 public debate about so far. I think this is a very complicated issue that will
23 require some time to sort out. I'm glad we got the discussions started. I think
24 there's a long way to go with this. I think there's a lot of questions that have to be
25 asked and answered. So I guess I would say I'm happy we got the conversation

1 started but I think there's a long way to go.

2 MR. LEEDS: Okay. Sir, can you please provide your views on
3 reprocessing? Do you support developing a regulatory framework for
4 reprocessing spent fuel?

5 COMMISSIONER MAGWOOD: I guess I would put it in the context
6 of -- it's not an absolute whether I would support a regulatory framework for
7 reprocessing. I think it's a question of whether it's one of our higher priorities --
8 and quite frankly, I don't think it is one of our higher priorities right now. I would
9 much rather the staff focus its attention on dealing with design certification, with
10 the [unintelligible] we're looking at, looking to enrichment [spelled phonetically]
11 facility technologies that are coming before the agency. It's hard -- I don't see
12 really any effort in industry to bring a processing plant to the Commission in the
13 near future. And therefore I don't think it's where we should put our highest
14 priority. Also, I think there's significant questions about what type of
15 reprocessing technology would be deployed in the United States. I've heard
16 Secretary of Energy Chu speak about the need to develop new technologies for
17 recycling. Some of those technologies are quite some ways away. So I would
18 say that, you know, while -- if someone were to have an active effort to present a
19 technology to us that we would try to be prepared to deal with it, but I don't think
20 it's one of our higher priorities.

21 MR. LEEDS: Okay. Thank you. Commissioner, you mentioned
22 the importance of learning to work well with the other government agencies going
23 forward. How would you characterize the staff's working relationships with
24 agencies such as FEMA, FERC [spelled phonetically], NERC [spelled
25 phonetically], the EPA, as the regulatory authority of those agencies overlaps

1 that of the NRC?

2 COMMISSIONER MAGWOOD: In the general manner, I think it's
3 quite good. There's obviously some areas where the relationships are a little
4 challenged, where we have disagreements, where we have continuing debates.
5 But as a whole, I think our relationship with other agencies is very good. In fact, I
6 think that NRC's views are often actively sought by many of these other agencies
7 for many subjects. So, you know, I wouldn't [unintelligible] for each of the
8 agencies, but I think that in almost all those cases, you could find a recent
9 example where NRC and another agency has reached an agreement to move
10 forward and advance progress in some area, and done so in a very, very
11 collaborative fashion.

12 MR. LEEDS: All right. Commissioner, with regard to managing
13 fatigue, the Part 26, Subpart I rule, is the Commission considering options for
14 mechanisms for moving to the 54 hours-per-week schedule?

15 COMMISSIONER MAGWOOD: I think the answer to that is yes, if I
16 understand the question. Yes.

17 MR. LEEDS: Would you like to elaborate on any of the options?

18 COMMISSIONER MAGWOOD: Not at this time. It's another
19 matter before the Commission. I think that it's something that we are quite
20 interested in -- the chairman made some comments about this yesterday, and
21 that's described in his comments on this. So I don't think I have anything really
22 to add.

23 MR. LEEDS: Okay. All right. We'll go to the next question.
24 Issuance of renewed licenses have not been occurring within expected
25 timeframes. Will the extended schedules influence how the Commission works

1 going forward to get greater certainty in the license renewal process?

2 COMMISSIONER MAGWOOD: Well, actually the license renewal
3 process is working quite well. As I think you heard yesterday, we've licensed, I
4 think, 62 -- is the number correct? -- 62 reactors already. There's another 20 that
5 are under consideration. We've actually had a very good track record with
6 keeping those on schedule. The most -- the vast majority have met or exceeded
7 the schedule -- or met, or beat the schedule. There obviously are some -- I think
8 someone used the term outliers -- there obviously are some that have taken
9 much longer than expected. But, you know, these, I think it's almost the same
10 kind of response I have for new plants -- it makes sense to go through these
11 questions methodically. I think it makes sense to spend the time and give the
12 public a full voice in these conversations. That said, we shouldn't -- it's not a
13 matter we should just let go indefinitely, but I think we should try to control the
14 schedules as much as we can, but I don't think we should ever forestall public
15 debate and public comment on any regulatory action. So, I think that we --
16 looking forward, we'll always try to find ways of managing this process. I
17 personally have made a commitment to myself that I will watch more closely as
18 we go forward with these license renewals and make sure that the schedules are
19 being maintained as far as they can be. But again, I don't think we should ever
20 apologize for how long these things take. I think they take as long as they take,
21 and I think that's just the nature of regulatory work.

22 MR. LEEDS: Okay, thank you. Commissioner, would you please
23 explain your philosophy on public education without, quote-unquote, promoting
24 nuclear power.

25 COMMISSIONER MAGWOOD: Well, this is actually a

1 conversation that we've had a lot in the last year with -- I've had with many
2 people. You know, I think that there's a lot that agencies like NRC can do to
3 educate the public that are not promotional. I think it's not promotional to explain
4 what nuclear technology looks like, what radiation effects do, what -- where
5 plants are located, what happens to spent fuel -- I don't think that's promotional
6 to provide that kind of information. As my colleagues have heard from me, I
7 visited our colleagues at the regulatory agency CSN [spelled phonetically] in
8 Spain, and they have a pretty extensive public education effort, including an
9 information center which invites members of the public to come in and learn
10 about nuclear technology and radiation. I don't think these are promotional. I
11 think there's a long distance between providing basic science and technology
12 information and encouraging that nuclear plants be built, or that reprocessing be
13 pursued, or any particular action. So I think that there's a difference between
14 those two. Obviously that's not something where everyone agrees, but my view
15 is that we can do [spelled phonetically] a lot more than we do, and that we should
16 do more.

17 MR. LEEDS: Thank you. Commissioner, you mentioned the
18 potential revision to the role and responsibilities of the Office of the General
19 Counsel. What types of changes do you have in mind, and what difference
20 served?

21 COMMISSIONER MAGWOOD: I think I would -- I've actually
22 thought about different possibilities with that. And I'm not sure I want to use the
23 word weaknesses -- I look at it more in terms of preparing for the future. I think
24 there are areas where, in the future, that it's important that there be absolutely no
25 question about the independent judgment of the Office of General Counsel in any

1 matters approaching the Commission, and that we should do what we can to
2 strengthen that role. I think that as we go forward, these sorts of offices within
3 the agency, including the EDO, the General Counsel, the CFO. I think that they
4 have responsibilities beyond the Commission, I think they have responsibilities to
5 the agency as a whole, to the government as a whole, to the public as a whole.
6 And I just would like to see those emphasized. So I wouldn't -- I don't think I
7 would point to any weaknesses at this point, but I want to be prepared for the
8 future.

9 MR. LEEDS: Thank you. Commissioner, given all the new and
10 ongoing risk-informed activities at the NRC, is the Commission considering to
11 significantly increase PRA resources within the staff to address these activities?

12 COMMISSIONER MAGWOOD: I almost think I should leave that
13 for the next speaker. No, I think -- I -- it's an excellent question. We're actually
14 just now beginning to engage in a conversation about future budget planning. I
15 think this will be one of the factors we'll want to talk about as a Commission.

16 MR. LEEDS: Good. Commissioner, what is your view about NRC's
17 role with regard to non-light-water advanced reactor reviews and designs? Any
18 thoughts with regard to what NRC needs to do to prepare for those?

19 COMMISSIONER MAGWOOD: Well, I think NRC is doing
20 everything it can responsibly do at this point. With the non-light-water
21 technologies, I think that we've put the most emphasis, in recent years, on high-
22 chemistry [spelled phonetically] gas reactors, the NGNP Project, for example,
23 and somewhat less on fast reactor technology. But there's an ongoing effort
24 within the staff to stay cognizant on these technologies, to prepare for the long
25 term future. But it's difficult to argue that we're going to be presented with a fast

1 reactor proposal anytime in the very near future. So I think it would be unwise for
2 us to divert resources from the work that's before us today to accelerate those
3 efforts, absent some firm plan. If a plan begins to develop, and we really have
4 the sense that something is coming, we can look at that. But right now I don't
5 think the plans are there, and it's hard to make that argument.

6 MR. LEEDS: Thank you. All right. Commissioner, you presented
7 a period, from 1991 to 2000, where there were -- innovative actions were
8 adopted to improve regulation and plant performance. However, over the past
9 several years, regulatory burdens have increased, creating a difficult
10 environment to maintain the safety improvements and safety focus. What can be
11 done to get back on track?

12 COMMISSIONER MAGWOOD: Well, I'm not sure I accept the
13 premise of that question. But I would emphasize one point that I made, that we
14 ought to look at the cumulative effects of regulation. But, again, as I said, there's
15 a [unintelligible] that we should be looking at the cumulative risk of plant
16 activities. So I think that we ought to be looking at these things, and I think
17 Commissioner Svinicki made very eloquent comments yesterday about the need
18 to look at everything in its entire context. And we should do that.

19 MR. LEEDS: Good. All right, sir, I've got one more question for
20 you. INPO is recognized as having helped improve industry performance quite
21 significantly since Three Mile Island. How do you think NRC has helped the
22 industry improve their safety performance?

23 COMMISSIONER MAGWOOD: Well, you know, I think that one of
24 the things that NRC has done over the years is provided a context in which
25 safety performance has been able to be enhanced. I think that the innovation of

1 the reactor oversight process has contributed significantly to improve safety at
2 nuclear plants. And I think that the use of risk-informed totals [spelled
3 phonetically] has also contributed to that. I think that, for example, I think the
4 chairman mentioned yesterday, the effort to implement NFPA 805 [spelled
5 phonetically], I think that will contribute further to safety at nuclear plants. So I
6 think there's a -- I think there's certainly a lot of things that happened over a long
7 period of time that have contributed to increased safety. I think as an overall
8 matter, the agency has created and fostered an environment that provides
9 greater flexibility in a context of enhanced safety. So I think we've been very
10 successful with that.

11 MR. LEEDS: All right. Well, thank you very much, Commissioner.

12 COMMISSIONER MAGWOOD: Thank you, thank you.

13 [applause]

14 MR. LEEDS: Now, at this time I would like to invite Brian Sheron
15 and Commissioner Apostolakis to the podium.

16 MR. SHERON: Good morning. I'm Brian Sheron, Director of the
17 Office of Nuclear Regulatory Research, and it's my pleasure to introduce
18 Commissioner George Apostolakis. The Honorable George Apostolakis was
19 sworn in as a commissioner of the United States Nuclear Regulatory
20 Commission on April 23, 2010 to a term ending on June 30, 2014. Dr.
21 Apostolakis has had a distinguished career as an engineer, professor, and risk
22 analyst. Before joining the NRC, he was the Korea Electric Power Corporation
23 professor of nuclear science and engineering and a professor of engineering
24 systems at the Massachusetts Institute of Technology. He was also a member
25 and former chairman of the Statutory Advisory Committee on Reactor

1 Safeguards of the NRC.

2 In 2007, Dr. Apostolakis was elected to the National Academy of
3 Engineering for innovations in the theory and practice of probabilistic risk
4 assessment and risk management. Dr. Apostolakis received his diploma in
5 electrical engineering from the National Technical University in Athens, Greece in
6 1969. He earned a master's degree in engineering science from the California
7 Institute of Technology in 1970, and a Ph.D. in engineering science and applied
8 mathematics in 1973, both from Cal Tech. Please join me in giving a warm
9 welcome to Commissioner Apostolakis.

10 [applause]

11 COMMISSIONER APOSTOLAKIS: Thank you very much. Thank
12 you, Brian. It is a pleasure to be participating with all of you in my first
13 Regulatory Information Conference as a commissioner. Before we begin, I'd like
14 to recognize the NRC management and staff efforts in the planning and
15 execution of another outstanding conference. During my first year as a
16 commissioner, I have been in a learning mode. I have had the opportunity to visit
17 some reactor and materials facilities, and to speak with diverse stakeholders and
18 interested observers in various settings, including many Commission briefings
19 that involved both NRC staff and external stakeholders.

20 I would also like to acknowledge how wise Congress's decision to
21 establish a five-member commission was. I always find the perspectives of my
22 fellow commissioners on policy matters thoughtful and interesting. I would like to
23 use this first opportunity to provide a sketch of my background to you, so you can
24 understand the views that I bring to this assignment and to list some of the areas
25 that are of interest to me.

1 With that, I want you to know that my focus is the same as that of
2 the Commission, namely ensuring the safety and security of all our licensed
3 activities, including operating reactors, fuel facilities, waste disposal, and the use
4 of radioactive materials. As Brian said, before joining the NRC, I was a professor
5 at MIT. My primary research interests were in the development of models for the
6 assessment of risks from large technological systems with a focus on nuclear
7 power reactors. Again, as Brian said, I was also a member and former chairman
8 of the ACRS. My tenure with the ACRS has been invaluable in allowing me to
9 step right into my role as a commissioner since I had a decade and a half to
10 become familiar with many of the issues the agency has faced in the past and is
11 facing now.

12 Of course, the roles of the ACRS and the Commission are different.
13 I now have to make actual decisions, as opposed to providing advice. In
14 addition, I am no longer allowed to interrupt speakers who come before me, thus
15 depriving me of one of the great pleasures of being an ACRS member.

16 [laughter]

17 In my opinion, the NRC is the preeminent contributor to protection
18 of public health and safety among organizations external to the licensees. We
19 must continue to ensure that the public has confidence in the strong and
20 predictable regulatory safety and security framework of the Commission. In this
21 regard, I know that we were given recently a new point of reference. It is the
22 executive order that President Obama issued last January, and I fully agree with
23 the comments that Commissioner Svinicki made yesterday that the NRC has
24 been moving its regulations in the direction of the executive order for a long time,
25 way back from the 1990s, before the order was issued. I would only like to add

1 one comment. The executive order has a section that's called General Principles
2 of Regulation, where it states, among other things, "Our regulatory system must
3 identify and use the best, most innovative, and least burdensome tools for
4 achieving regulatory ends." I note that the Commission stated, way back in
5 1995, in its PRA policy statement, "The PRA should be used to reduce
6 unnecessary conservatisms [spelled phonetically] associated with current
7 regulatory requirements."

8 Two success stories that exemplify the benefits of using risk
9 insights are the reactor oversight process and the risk-informed in-service
10 inspection of piping. The reactor oversight process has allowed us to respond to
11 inspection findings in a way that is commensurate with the risk significance of
12 these findings. It has also gone a long way toward promoting predictability in the
13 regulatory system. The risk-informed in-service inspection program has allowed
14 both the NRC and the licensees to focus the inspections on piping segments that
15 are susceptible to degradation mechanisms and are risk significant, thus
16 improving safety and reducing licensee regulatory burden.

17 Now, you have already noticed that my two examples are from the
18 reactor arena. This is because that's where most progress has been made.
19 However, I would like to recognize that the agency has also made progress in the
20 use of risk insights in its regulation of the use of radioactive materials.

21 In my opinion, all areas under NRC jurisdiction would benefit from
22 greater use of risk insights. I do acknowledge, however, that the application of
23 the methods we have developed for reactors and waste depositories, the
24 application to other NRC activities is not straightforward. This is particularly true
25 for security when events do not necessarily happen because of some random

1 phenomenon, but instead because of the deliberate actions of an adversary. In
2 this regard, I suggest that instead of trying to transfer risk methods that have
3 been developed for reactors for security, we should go back to the fundamental
4 questions that analysts ask when performing risk assessments: what can go
5 wrong? What are its consequences? How likely is it? Starting with
6 fundamentals is always a good idea when dealing with a new situation.

7 Now I would like to share my thoughts on a few specific areas of
8 interest. The Commission has a longstanding policy of encouraging the
9 increased use of risk information in regulatory programs and processes to the
10 extent supported by the state-of-the-art. However, even for reactors, the use of
11 risk information has not yet been fully integrated into the reactor licensing
12 process. Although the part of the regulations of governizations [spelled
13 phonetically] of early site [spelled phonetically] permits, standard design
14 certifications [spelled phonetically], and combined licenses for new reactors, the
15 so-called Part 52 -- although this part requires an application to -- an applicant to
16 submit a PRA summary, current review programs and guidance are still based on
17 Part 50, that is the traditional way of licensing, and do not fully realize the
18 potential benefits of risk informing the licensing process. As a consequence, I
19 believe that the agency faces some special challenges and opportunities as it
20 prepares to receive, in the near future, applications for design certification of
21 small modular reactors.

22 An important question which many are asking is whether the
23 licensing review of such reactors should be the same as that for large reactors.
24 In July of last year, Chairman Jaczko and I proposed to our fellow
25 commissioners, and they agreed, to direct the staff to provide the Commission

1 with a policy paper that addresses the development of a framework,
2 implementation strategy, and plans and schedules to more fully integrate the use
3 of risk insights into pre-application activities, and in the reviews of small modular
4 reactor applications. Staff was also directed to focus its initial effort on how risk
5 insights would be used to identify risk significant systems, structures, and
6 components, and other aspects of the designs that contribute most to safety.

7 Near-term efforts would be focused on integral pressurized water
8 reactors. In my view, and the view of the Commission, the results of these efforts
9 should allow the NRC staff to be better prepared to conduct more safety-focused
10 and efficient reviews of SMR applications, and thus be better able to respond in a
11 timely manner to licensing requests. A long-term objective of this initiative is to
12 develop a risk-informed performance-based regulatory framework building on the
13 SMR reviews, as well as on insights gained from the next generation nuclear
14 plant pre-application review activities, and the lessons learned from the earlier
15 technology neutral [spelled phonetically] framework. The staff provided this
16 statement to the Commission recently for review and decision, and a public
17 Commission meeting on this matter has been scheduled for the 29 of this month.

18 Let me now offer some further thoughts on how risk insights may
19 inform our regulations. There have been numerous PRAs completed for the
20 current generation of light-water reactors, both in the United States and
21 internationally. I believe it is fair to say that this wealth of knowledge, combined
22 with several decades of operating experience, has given us a very good
23 understanding of what the likely accident sequences are for light-water reactors.
24 The analysis of these potential accident sequences in a PRA, probabilistic risk
25 assessment, is as realistic as possible, and of course includes the possibility that

1 plant operators may intervene and act correctly, or incorrectly. However, as I
2 said earlier, this wealth of information has not been integrated in our regulations
3 to a significant extent. The stylized design basis accidents continue to reign
4 supreme. There are signs, nonetheless, that important issues may not be
5 resolved optimally within the confines of the traditional design basis analysis, with
6 their numerous conservative assumptions.

7 An example is the so-called Generic Safety Issue 191, whose title
8 is, "Assessment of Debris Accumulation on PWR Sump Performance." A very
9 short summary: following the loss-of-coolant [spelled phonetically] accident, the
10 emergency core cooling system is expected to cool the core by recirculating
11 water that has settled at the bottom of the containment. This water, however,
12 may contain debris that could clog the sump strainers that are designed to
13 prevent debris from entering the emergency core cooling system and the reactor
14 core. This clogging would inhibit reactor core cooling. The industry has argued
15 that using a risk-informed approach would allow for a practical assessment of
16 plant design features, and open interactions [spelled phonetically] that could
17 reduce plant dependence on some recirculation for long-term cooling, through
18 better water management, for example, by refilling the refueling water storage
19 tank, and manually operating the containment spray system.

20 A strict design basis analysis does not allow the consideration of
21 human actions. A question that arises then is whether we have sufficient
22 understanding of operator actions to allow a risk-informed approach. I
23 acknowledge that many people are uncomfortable with the perceived large
24 uncertainties associated with the probabilities of operator errors. However, the
25 NRC has expended considerable resources developing guidance for the

1 evaluation of operator actions. For example, we have published reports on good
2 practices and we have evaluated existing human reliability analysis methods
3 versus these good practices. The NRC's Office of Nuclear Regulatory Research
4 in the industry are currently working on a consensus human reliability analysis
5 model. The use of such a model would improve the validity, consistency,
6 transparency, and traceability of human error evaluations. Lessons learned from
7 a series of experiments conducted at the Halden Reactor Project Laboratory in
8 Norway, and the international effort on better understanding the strengths and
9 limitations of the existing human reliability analysis models, are both inputs
10 [spelled phonetically] to the effort to develop a consensus model.

11 So, the question in my mind is given that human performance is an
12 integral part of nuclear power operations, why do we continue to ignore the
13 products from these research activities in our regulatory decision-making?
14 Furthermore, without feedback from regulatory decision-making, how do we
15 know that we are spending our human reliability analysis research resources in
16 the most intelligent way?

17 In our efforts to risk-inform the regulations, the agency has
18 introduced the critical concept of the transition break size, which divides five
19 breaks into two intervals. The Commission has directed the staff to define the
20 transition break size as the pipe size that is expected to fail with a frequency of
21 one in a 100,000 years. Breaks below the TBS, transition break size, are subject
22 to the current requirements in the regulations 10 CFR 50.46 for the emergency
23 core cooling system. Breaks above the TBS are subject to new requirements
24 described in the proposed rule 10 CFR 50.46a. This voluntary proposal is of
25 great significance in that it uses risk information and insights to revise the

1 requirements associated with mitigating the stylized design basis double-ended
2 guillotine break. A question then is where did the numerical value of the
3 transition break size come from? The answer is that because the frequency of
4 failure of pipes is very low -- large pipes is very low, expert judgment was used to
5 estimate loss-of-coolant accident frequencies. These frequencies provided the
6 basis for selecting the TBS. And this leads me to another topic of interest to me,
7 the utilization of expert judgment by the NRC.

8 The formal utilization of expert judgment in significant engineering
9 issues has been pioneered by these agents [spelled phonetically]. It is a process
10 that provides either quantitative estimates for the frequency and/or significance of
11 physical phenomena, or qualitative insights into the nature, scope, and
12 significance of physical phenomena. Expert judgment is used when the following
13 conditions are present: the available data or operating experience is sparse and
14 not directly applicable to the problem at hand, the subject is too complex to
15 model accurately, and the phenomena or issues have significant safety or
16 regulatory implications.

17 Expert judgment has been a principle component of the technical
18 basis for many important regulatory decisions, and its use is expected to be more
19 prevalent in the future as issues become more complex and as technology
20 evolves. There are many similarities, but also significant differences, in the
21 approaches used in previous studies, that can impact regulatory decision-
22 making. For example, a unique feature of the loss-of-coolant accident frequency
23 study was the adjustment of results to account for the well-known overconfidence
24 that is typically present in individual expert judgments. In short, people know, or
25 think that they know, more than they do.

1 The study also recommended a less common scheme for
2 aggregating the individual expert results into group estimates. Sensitivity studies
3 indicate that the selection of the aggregation scheme affected the results
4 significantly. When the recommended but less common aggregation scheme is
5 used, the transition break size for a pressurized water reactor is approximately
6 six inches, while if we aggregate using more common methods, we get a
7 transition break size of eleven inches. I believe that the NRC would benefit from
8 formal guidance to assist the staff in choosing the method for obtaining and
9 utilizing expert judgment to avoid the pitfalls of the past and ensure the
10 appropriate level of effort. Selecting and documenting the appropriateness of the
11 methods of analysis ahead of the regulatory decision should increase
12 transparency and public confidence.

13 I would like to end this speech by telling you of an important recent
14 initiative. Chairman Jaczko asked that I lead a taskforce for the assessment of
15 options for a more holistic, risk-informed, performance-based, regulatory
16 approach. The taskforce is charged with developing a strategic vision as well as
17 options for pursuing such a regulatory approach for reactors, materials, waste,
18 fuel cycles, security, and transportation that would continue to ensure the safe
19 and secure use of nuclear materials. The taskforce is to propose specific actions
20 that the NRC could pursue to achieve a more comprehensive and holistic, risk-
21 informed, performance-based system. And the taskforce is expected to provide
22 its recommendations within one year.

23 Realizing that there were similar efforts in the past, I would like to
24 offer my vision as to why we are pursuing this effort now and what outcomes we
25 seek. As I said earlier, I believe the fundamental concepts of risk analysis, what

1 can go wrong, what are the consequences, and how likely is it is broadly
2 applicable to all aspects of our regulatory functions. This set of risk
3 [unintelligible] helps us to frame the information we need to make decisions
4 systematically, transparently, and in an integrated fashion. A risk-informed
5 approach is designed to focus the licensing and inspection efforts on the most
6 risk-significant areas, thus increasing effectiveness and efficiency. With current
7 projections for continuous flat [spelled phonetically] budgets for the foreseeable
8 future, and the expected increase in the number of new reactor applications and
9 licensing activities, I believe that the agency must adjust the way it does
10 business.

11 The agency must find a way to risk-inform its decision-making
12 processes so that it can effectively prioritize its licensing reviews and inspections,
13 and focus its resources on areas of high-risk significance. If we were to predict
14 what the nuclear industry may look like, say, 20 years in the future, we can
15 probably all agree that it may look very different than the way it does today.
16 Consider the number of new reactor designs with passive safety features and
17 digital instrumentation and controls, the small modular reactors, the aging issues
18 associated with life beyond 60 years for the light-water reactor fleet, the new fuel
19 site facilities, and advances in the medical uses of nuclear materials, as well as
20 changes in the security threats.

21 With these likely changes in mind, we can easily conclude that the
22 regulatory environment must change and adapt to ensure proper oversight and
23 responsible licensing and inspection activities for adequate protection and
24 regulatory enforcement. Our work on risk-informing the licensing reviews of
25 SMRs is a good step in this direction. Over the next 11 months, the taskforce will

1 look candidly at where we have effectively and successfully transitioned to a risk-
2 informed, performance-based regulatory process, and where we can and must
3 do better.

4 Armed with these insights, we will be able to provide options and
5 formulate strategies for the next 10, 15 years. Although I firmly believe there is
6 always a role for probabilistic risk analysis, I am also prepared to accept the fact
7 that in some of our activities, there remains work to be done to make it practical.
8 In fact, there may be instances where the explicit use of documentation of a
9 probabilistic approach may just not be realistic for the foreseeable future.

10 Clearly, this effort could not be successful without meaningful stakeholder input.
11 We plan to start within the agency and, at the appropriate times, solicit input from
12 external stakeholders. Recognizing that the regulators and the regulated
13 industry have different sets of considerations and different roles and
14 responsibilities, external stakeholder input will help us in designing sound and
15 effective long-term strategies.

16 The questions to which the taskforce will seek answers include the
17 following: are the current practices adequate for accomplishing the goal of a
18 holistic, risk-informed, and performance-based regulatory structure? How
19 effective have past and ongoing risk-informed initiatives been? What are the
20 relevant lessons learned from these initiatives? Should the use of risk
21 information continue to be voluntary? How effective have recent major
22 deterministic licensing actions been? What are the relevant lessons? What are
23 the visions for a holistic, risk-informed, performance-based regulatory structure
24 for reactors, materials, waste, fuel cycle, and security? How can the transition
25 from the current system to a more holistic system -- a holistic regulatory structure

1 be optimized? And there are several other questions.

2 I have talked a lot about bringing more risk information into the
3 agency's decision-making processes. I don't want you to give you -- I don't want
4 to give you the impression that I do not appreciate the value of traditional
5 approaches. I'm fully aware of the value of defense-in-depth [spelled
6 phonetically] and large safety margins in protecting us against unknown
7 unknowns. I am also fully aware of the limitations of risk assessment. The
8 challenge before us is how to develop a system that would increase the benefits
9 of both approaches for managing uncertainty.

10 I appreciate your attention, and I look forward to working with you
11 during my time as a commissioner. Thank you very much.

12 [applause]

13 COMMISSIONER APOSTOLAKIS: Why, thank you. You have a
14 few questions there, Brian?

15 MR. SHERON: I've got many questions. I think you've provoked a
16 lot of thought about PRA. We had a couple here, I'm going to just read one, but I
17 think there was a number of them that were related. This one is the performance
18 indicators that go into the NRC's action matrix generally have a quantitative or
19 objective set of criteria except for security, which remains relatively subjective.
20 What can be done to perhaps make the security-related input more risk-
21 informed?

22 COMMISSIONER APOSTOLAKIS: Well, again, as I said, security
23 is an area where we really have to think hard, how risk information can be
24 produced. And I don't know myself, I don't think anybody knows. There was a
25 recent report out of the National Academies [spelled phonetically] on the

1 utilization of risk information and the protection of nuclear weapons. And their
2 recommendation, or their conclusion, was also that it's premature, we don't have
3 the tools yet to be able to use risk analysis in situations where you have an
4 adversary. So -- and that's why I said maybe we should go back to the
5 fundamental questions of what can go wrong and so on and see where those will
6 take us. So I really don't know what the answer is.

7 MR. SHERON: Given that plant management and safety culture
8 have a very large effect on plant safety, do you think that these factors can be
9 adequately modeled in a PRA?

10 COMMISSIONER APOSTOLAKIS: No, I do not.

11 [laughter]

12 You want a shorter [spelled phonetically] answer?

13 [laughter]

14 MR. SHERON: Could the commissioner share with us his
15 perspective and expectation of what the reactor and materials licensees should
16 do in their part -- on their part to make the risk-informed regulatory approach a
17 success story?

18 COMMISSIONER APOSTOLAKIS: Well, one of the things they
19 can do is, in support of the chairman's comment yesterday, is to support the
20 development of PRA tools for a level three PRA, and maybe do some level three
21 PRAs. And also be more willing to deal with uncertainty quantitatively. A lot of
22 times, people try to do just a quick point [spelled phonetically] estimate,
23 calculation, and ignore uncertainties, or they do sensitivity studies instead of
24 uncertainty analysis. It seems to me, we now have the software tools that allow
25 us to do a full uncertainty analysis and that will much better inform our decision-

1 making processes, so I think there's room for improvement, but at the same time
2 I must say a lot of the good initiatives, risk-informed initiatives, came from the
3 industry, so there's always room for improvement.

4 MR. SHERON: Okay. Recognizing that no SMR designs are
5 currently ready for review, the anticipated length of time needed to license SMRs
6 will be three to four years. What can the NRC or DOE do to expedite the
7 licensing process, possibly through the PRA process?

8 COMMISSIONER APOSTOLAKIS: Well, again, first of all, I'll
9 repeat what Commissioner Magwood said, if it takes three years, it takes three
10 years. I mean, that's the process. We have to make sure that there is adequate
11 protection of public health and safety. A major thrust of the SRM that the staff
12 requires, the memorandum that the Commission issued last July, and the staff
13 responded by the paper they sent up a few weeks ago, is to make the review
14 process more safety-focused, of course, but also more efficient. So this is one of
15 the things that we're doing, I mean, we're doing the best we can to shorten the
16 process, to the extent that it can be shortened.

17 MR. SHERON: What is it like being a new commissioner of a
18 regulatory agency serving in the current global and economic environment?
19 What challenges are you facing?

20 COMMISSIONER APOSTOLAKIS: Coming from academia, I was
21 not used to having people disagree with me.

22 [laughter]

23 Not only that, but sometimes they win the argument.

24 [laughter]

25 So, that was a shock, but the ACRS prepared me for it --

1 [laughter]

2 -- so it was not as big a shock as perhaps it would have been. No,
3 I'm very happy with it, and I really appreciate the collegiality of the Commission,
4 and listening to my colleagues on one-on-one meetings, or reading their votes, I
5 always learn something, so I'm very pleased.

6 MR. SHERON: Okay. As the leader of the taskforce, how do you
7 intend to engage representatives from the industry in developing your
8 recommendations?

9 COMMISSIONER APOSTOLAKIS: Well, this will be a challenge,
10 because we only have one year, or 11 months left. So, obviously, I cannot go
11 through the formal process of public meetings and so on. I have already spoken
12 to some people from the industry, I've received very useful input, and we will
13 continue doing this. But we have to be mindful of the fact that we have to have a
14 product in about 11 months. But I also plan to talk to as many members of our
15 staff as possible, especially in areas other than reactors.

16 MR. SHERON: There's a couple here on use of PRA for reactors
17 that have not been built yet. Let me just read one. How can you justify the
18 increased use of risk in the licensing of reactors that have not yet been built or
19 operated anywhere? PRA uncertainties remain large, even for current
20 generation reactors.

21 COMMISSIONER APOSTOLAKIS: Oh, first of all, I'm not sure that
22 the last statement is correct. But what is large? Again, the alternative is not to
23 do anything. And that is -- that's what I find unacceptable, I mean, sure, in the
24 design certification process, we don't have a lot of the information that we would
25 need to do a good PRA for an operating facility, and we are fully cognizant of that

1 fact. However, we can still get useful information. In fact, the vendors
2 themselves have utilized insights from those PRAs that they did when they were
3 completing the designs, in some instances, they did change the design. So it is
4 useful information, as long as you are fully aware of the fact that it's not a
5 complete plan, you don't have all the information you might need, and you act
6 accordingly. And that's where, it seems to me, the traditional approach or
7 philosophy of defense-in-depth will play a much bigger role.

8 MR. SHERON: Okay.

9 COMMISSIONER APOSTOLAKIS: The unknown unknowns.

10 MR. SHERON: Okay. How have successes and failures of PRA in
11 other fields affected your views on how NRC should use PRA? What lessons
12 does the BP explosion/spill have for NRC and for PRA in particular?

13 COMMISSIONER APOSTALAKIS: I don't think the lessons are for
14 the NRC. The lessons are for BP.

15 [laughter]

16 They should learn what defense-in-depth means.

17 MR. SHERON: What are your views on the ISA process used in --
18 for fuel cycle versus a PRA process?

19 COMMISSIONER APOSTALAKIS: I really wonder why that
20 question was asked. We asked -- the Commission asked the ACRS to do a
21 review for us, and we have now the ACRS report, and I am studying it. So I am
22 revising my views on ISA.

23 MR. SHERON: In this budget environment, do you see a problem
24 in balancing funds supporting SMR research versus funds supporting LWR life-
25 extension research?

1 COMMISSIONER APOSTALAKIS: Look, when it comes to
2 budgets, you always have constraints. You have to balance things. So I don't
3 think there is anything very unusual here. We have to do the best job we can
4 and find the resources to do a good job on both.

5 MR. SHERON: What does it take to make performance-based
6 regulation as much of a reality as risk-informed regulation?

7 COMMISSIONER APOSTALAKIS: Try, try, try again.

8 [laughter]

9 MR. SHERON: Okay, [unintelligible]. Well, we've got someone
10 here on [unintelligible].

11 [laughter]

12 COMMISSIONER APOSTALAKIS: You don't actually have to ask
13 any more questions [unintelligible].

14 [laughter]

15 MR. SHERON: Okay, here's the -- how do you see the split in
16 responsibilities between licensee and regulatory organizations in the collection of
17 experimental data to validate and confirm safety assessments?

18 COMMISSIONER APOSTALAKIS: I really haven't thought about
19 that, and I don't even know that there's a split. So, I'm sorry, I don't know.

20 MR. SHERON: That's okay.

21 [laughter]

22 I think you answered that [unintelligible].

23 [laughter]

24 Let me find -- here we go. You may have answered this. Do you
25 believe PRA quality is sufficient to provide a basis for risk-informed transient and

1 accident analysis?

2 COMMISSIONER APOSTALAKIS: Yes, I do. And, remember,
3 now, it's not risk-based approach that I'm advocating. So, in some areas,
4 perhaps the quality is not as we would desire, and in that case, of course, then
5 we go back to our good old safety margins of defense-in-depth. I mean, I must
6 say that we have to recognize that the ultimate decisions -- regulatory decisions -
7 - are not based on a single analysis. They never have been. They're always
8 decisions based on -- made by senior managers of the NRC on important
9 matters based on a number of inputs. Some of these inputs are quantitative,
10 some of these inputs are qualitative, and so far, I don't know that this system has
11 failed us. I remember in the late '90s when we were putting together a guide for
12 risk-informed changes in the licensing basis, there is a nice picture there that
13 emphasizes integrated decision-making, and some people were uncomfortable,
14 "How's that going to work?" And so on. Twelve years later, I'm pleased to report
15 that here are no complaints. The licensees think that the decisions made by the
16 NRC staff are fair -- I mean, there are always disagreements on little things here
17 and there -- but the integrated decision-making process works very well. In some
18 cases, you give more weight to PRA results, in other cases, you don't. It
19 depends on the situation and how good the analysis is.

20 MR. SHERON: In the materials and waste areas, how would the
21 taskforce's efforts be different from other previous attempts to risk-informing
22 these areas?

23 COMMISSIONER APOSTALAKIS: We will build on the previous
24 attempts. We will definitely find the documents and talk to people if they're still
25 around, and try to build on what they have done.

1 MR. SHERON: I'm going to ask this one, even though I think she's
2 [spelled phonetically] staff.

3 [laughter]

4 It says, should our new thinking -- [inaudible] to the ACRS --

5 [laughter]

6 Should our new thinking on expert judgment apply to the ACRS? I
7 think this is the expert elicitation process.

8 COMMISSIONER APOSTALAKIS: Apply to the ACRS? I don't
9 understand the question. They are experts.

10 [laughter]

11 I'm sorry, I don't --

12 MR. SHERON: Okay. Can you give us your opinion on the
13 European regulators' position on the PSAs, mandatory level one and level two,
14 plus all modes of operation in external events, specifically without having an
15 integral framework on how to use the results?

16 COMMISSIONER APOSTALAKIS: No, I will not give you my
17 opinion.

18 [laughter]

19 MR. SHERON: Let's see. How can PRA and defense-in-depth
20 coexist?

21 COMMISSIONER APOSTALAKIS: They already do coexist -- for
22 almost 15 years. It's an uneasy coexistence, but they do coexist. It's 10:00,
23 [unintelligible].

24 [laughter]

25 MR. SHERON: Okay. Let's do one last question. Okay. No, it's

1 not that one.

2 [laughter]

3 All right. How applicable do you believe the attempt to create a
4 risk-informed regulation in Part 63 is to other areas of NRC regulation?

5 COMMISSIONER APOSTALAKIS: What was the question? How -
6 -

7 MR. SHERON: How applicable do you believe the attempt to
8 create a risk-based regulation in Part 63 is to other areas of NRC regulation?

9 COMMISSIONER APOSTALAKIS: Again, this is something that
10 the taskforce will explore, and I think it would be premature on my part to express
11 an opinion.

12 MR. SHERON: And I think you're right -- it is about 10:00, which is
13 --

14 [laughter]

15 It's time for the break. So with that, thank you very much.

16 [applause]

17 [break]

18 MR. LEEDS: All right, please, if everyone would take their seats,
19 we'll get started with the special plenary session. Again, my name is Eric Leeds,
20 I'm the Director of the Office of Nuclear Reactor Regulation. Before we get
21 started on the plenary session, the staff let me know that we have exceeded
22 3,400 reverence [spelled phonetically] -- so, a new record. Thank you all.

23 [applause]

24 Thank you all for being here -- we really appreciate your
25 participation. This year, we're doing a special plenary session. Last year was

1 the first year that we did it, a panel discussion with members of the industry, the
2 Nuclear Energy Institute, and the staff to address different issues. We received a
3 lot of positive feedback from last year's session, so I'm looking forward to this
4 year's session. The way that this is going to be run is I have a number of
5 questions already prepared by the NRC staff and staff from the Nuclear Energy
6 Institute that I'm going to address to our three panelists. We'll take about 40, 45
7 minutes doing that, and then I will take questions from the audience. I'm very
8 pleased to have up here on the podium with me Chip Pardee from Exelon, Tony
9 Pietrangelo from the Nuclear Energy Institute, and Marty Virgilio of the NRC.

10 So let me get -- let me find my glasses, and we'll get started. All
11 right, the first question -- and I'll address this to Marty, and then I'll follow to Tony
12 and to Chip. The first question: the NRC and the industry have new people and
13 new resources. What is being done to help new recruits understand our industry,
14 our nuclear culture, our historical decisions, the reasons for the operating
15 performance that we have today compared to 10 years ago so that we can build
16 on our past practices to continue to improve performance? Marty?

17 MR. VIRGILIO: Okay, Eric. Just to provide a little context first, I
18 think in Bill Borchardt's opening remarks, he talked about growth in the NRC.
19 And if I look back over maybe the last six, seven years, we've gone from a staff
20 of roughly 3,000 people to a staff of roughly 4,000 people. With that, we've
21 suffered some attrition, and Bill also mentioned that half the staff today has been
22 with us for less than five years. So this issue of knowledge management is a
23 very significant issue for us. We saw it coming, and I would say about the time
24 that we started hiring up, we started to take some very significant steps towards
25 this issue of knowledge management. What we did is we looked at, from a

1 human resources standpoint, what were the critical skills that we needed to instill
2 in the staff? What information did we need to transfer? What information did we
3 need to recapture? And then we thought about what were the tools that we
4 would need in order to communicate this information effectively?

5 And so we wound up, I think, relooking and retooling our
6 qualification programs for the staff at the NRC. We started looking at
7 mechanisms for transferring knowledge. I think one of the most effective ones
8 that we landed on was mentoring. We also looked at seminars, and we've held a
9 number of seminars since that hiring surge, including focusing on significant
10 issues in history, such as TMI, where we brought in a number of people that were
11 involved at the time including Harold Denton, and Governor Thornburgh, and
12 several others that were -- that had that firsthand knowledge, and were able to
13 communicate that, I think, very effectively to the staff.

14 As far as the IT side of it and the tools for communication, we
15 established a knowledge center where communities of practice, groups of people
16 that might be working on the same thing, can chat, share information, and absorb
17 some of the history that we've loaded into that software program. And looking
18 forward, I think we're continuing with the seminars, we're now looking at -- the
19 next major seminar is going to go back and look at 9/11. Where were we in
20 security before that point in time, how did that event change our programs, and
21 where are we going in the future?

22 MR. LEEDS: All right. Thank you, Marty. Tony, if you'd take that
23 for the industry -- or, if you want to pass it on to Chip?

24 MALE SPEAKER: Tony's going to pass it to me.

25 MR. LEEDS: Right. Thank you, Chip.

1 MR. PARDEE: We also have experienced over the past five years
2 or so a significant turnover in our workforce. And with that comes, as the
3 question infers, you know, the risk that we do somehow lose some of the lessons
4 of the past. So I'll answer the question from two different general pipelines of
5 people that we have coming in. Most of the technical and operations staff that
6 we typically hire from the local areas -- and they come in through very structured
7 qualification programs, as Marty was inferring. And part of those qualification
8 programs include not only current day standards and practices and such, but
9 some -- not all, some of the bases for how we got to where we got to. So, for the
10 operations and technical folks that are coming in, part of their formal training
11 programs that they're required to complete before they ever start completing jobs
12 -- completing tasks -- independently on their own.

13 For the professional staff, we start this instruction in our internship
14 program, and we have had issues with retention, mid-decade last decade --
15 where we would hire very highly qualified, highly engaged individuals out of
16 college, and we'd lose them after a couple of years because they did not
17 understand to the extent they needed to the industry that they were getting into.
18 So we now go back to our internship program, where the students come in during
19 their summers, while they're still completing their college educations, and during
20 that internship program we give them not only as full an exposure to what it's like
21 working in our nuclear stations as we can, but also much of the historical
22 perspective as much as we can impart upon them during relatively short periods
23 of time that go back to the days of Three Mile Island and some of the regulation
24 changes, the changes in training, Reactor Oversight Process changes, things like
25 that.

1 So, we start that in our internship program, and then, when and if
2 they are hired, it is also included in their qualification programs as well. I'll finish
3 by making a plug for an organization called North American Young Gen. in
4 Nuclear, and I'm sure there are number of members in the audience today, but
5 that organization independently has taken on, as one of many tasks, the task of
6 making sure that we do include historical perspective. This includes things like
7 tours of Three Mile Island Unit Two, which obviously introduces all sorts of
8 questions in their minds that we attempt to answer, but that's an outstanding
9 organization that really helps with that platform in our industry.

10 MR. LEEDS: Thank you so much, really agree with Young Gen.,
11 we have a number of our staff members involved also, a great organization. The
12 next question -- and Chip, I'm going to stick with you on this one if you'd go first,
13 and then we'll go to the other panelists. How do you see advanced technology
14 developing for new reactors? For example, digital I&C technology, how should
15 we leverage efforts to address current challenges?

16 MR. PARDEE: Well, I'll answer and then pass it to Tony in this
17 case. We -- first of all, I think advanced technology -- and in our case, it's back-
18 fitting our existing power plants. We're working on an early site permit for a
19 Greenfield [spelled phonetically] site down in Texas, but it's very slow going.
20 We're not contemplating new construction in the near future. However, the
21 question is obviously relevant to keeping the technology current in our existing 17
22 units, and we do this by carefully analyzing what products are available. I will
23 say that we have shied away from digital I&C upgrades and safety-related
24 applications because of the extensive period [inaudible] decide what acceptable
25 was. And being a fully merchant-generating fleet, we have to make sure there is

1 either a safety and/or a reliability basis to every upgrade that we make, because
2 we have to immediately justify the cost of it.

3 So we have moved aggressively with digital control systems on
4 balance a plant [spelled phonetically], or non-safety-related applications such as
5 turbine [spelled phonetically] EHC systems and such. We are going very slowly
6 on the safety-related -- trying to learn from the experiences of others in the
7 industry that are at the pointy end of these applications. But clearly, the reliability
8 of our units is enhanced by carefully selecting the proper upgrades to install in
9 our power plants, and new technology is key to not only more sophisticated
10 control, but also more intelligent monitoring of the status of our power plants.

11 MR. LEEDS: Okay, thank you. Tony.

12 MR.PIETRANGELO: I'm very hopeful that the licensing of the new
13 reactors -- because all the new reactor designs are using digital technology -- will
14 provide a comfort level in the staff with digital technology such that we can make
15 decisions on the operating plants to back technology. It's getting very, very
16 difficult to maintain the existing analog systems. It's hard to find technicians that
17 know how to work on analog anymore; they read about it in a history book
18 somewhere. So, it's not like it's new technology anymore, I think we've got to
19 find a way to make the licensing process more simple and straightforward and
20 predictable. I think that framework's been developed now, Oconee has gotten
21 through that process. Diablo Canyon will be the next one. We need to
22 incorporate lessons learned from those reviews so that guys like Chip can make
23 decisions to move forward in an environment where they can plan and execute
24 those back-fits in an efficient manner. I mean, that's what the regulatory stability
25 is all about and what's needed to make this happen.

1 I should also mention, you know, besides digital, the small reactor
2 designs are new technology. And at NEI, I think we add value by trying to pick
3 off the generic issues that are applicable to all the designs. We have several
4 papers in front of the Advanced Reactor Division and New Reactor Office on
5 generic issues like control room staffing, emergency planning, fees, et cetera.
6 There's about another eight or so that we'll be sending over this year; the
7 dialogue's taking place. Digital is going to be key to the success of small
8 modular reactors with respect to control room staffing. If we can't rely more on
9 digital in that application, it's going to be very, very difficult, I think, to make the
10 business model work for small reactors if we can't rely more on digital
11 technology.

12 MR. LEEDS: Thank you, Tony. Marty?

13 MR. VIRGILIO: Thanks, Eric. I'd start with the fact that we've done
14 some very targeted hiring to bring expertise onto the staff that we did not have
15 and did not need up until this point in time. We're trying to rely on proven digital
16 equipment and proven platforms, and I would echo everything my colleagues
17 have said, but I would also add that we're also trying to leverage the international
18 experience. Through the Multinational Design Evaluation Program, MDEP,
19 we've got a group that brings together 10 international regulators to focus on
20 instrumentation and control issues. That has been primarily used to support our
21 NRO and new licensing activities, but we are leveraging that work into our
22 operational reactor program, as well.

23 MR. LEEDS: Thank you, Marty. I am the moderator for this
24 session, but I'm not a potted plant, so I'm going to -- I have to jump in on this
25 one. I want to respond. I think Chip's points are well made. Something that I

1 heard [inaudible] Oconee, we have implemented digital technology on the non-
2 safety side, so it's a great opportunity for the industry to learn as many lessons
3 as they can in the implementation and what works and what doesn't work, so that
4 when we translate this -- as we translate it to the safety side of the house, we've
5 already learned those lessons so that we have less hiccups.

6 Now, on the regulatory side of the house, I've talked with the staff in
7 NRR, and I liken our position on digital I&C technology and incorporation of that
8 technology back to the times when we first started doing steam generator
9 replacements. If you recall, the first replacements at Palisades required a license
10 amendment. And the staff spent literally thousands of hours inspecting those
11 replacements. Now it's done under 50.59, it's a routine inspection, we've gotten
12 there. And I think that's the direction that we need to head, I think that's the
13 vision that we need to get to. It'll take work on both sides. Let me get to the third
14 question. For -- and I'll go back again to Chip to begin with this question -- what
15 are the industry's priorities over the next five years? Or, Chip -- you're going to
16 hand that to Tony?

17 MR. PARDEE: I am. And then I'll embellish upon his comments.

18 MR. LEEDS: All right. That's fine.

19 MR. PIETRANGELO: I'm pretty sure this was an NEI staff plant
20 question, here. We have, in our annual planning process, annual deliverables,
21 but we also have outcomes we're looking for in 2015. More of our goal
22 [inaudible] we're [unintelligible] to achieve. Chip chairs on of our advisory
23 committees; we have five different ones that review our deliverables and goals
24 and outcomes, and I'm just going to go through, right from our annual plan, what
25 we're about here. The first priority will always be current fleet safety and

1 reliability. We can never take our eye off the ball. Our support, both with the
2 public, with the Congress, is predicated on the current plants operating safely
3 and reliably, and we cannot take our eye off that ball.

4 Our monitor is enhancing stability and predictability of the reg
5 process. What that means is trying to get to more efficient issue closure. We're
6 trying to -- and I'll talk a little bit about -- you know, there's been some discussion
7 in the Commission talks about the cumulative effects of regulation. Let me give
8 another level of granularity on that. We're at a life cycle with our plants where
9 we've got several units now that are post-40 years old, many more approaching
10 that point. There's asset management plans for those plants that include steam
11 generator replacements, vessel head replacements, motor rewinds, turbine
12 refurbishments, et cetera -- there's a lot going on given that point where we're at
13 in the asset management or life cycle. That's why we want to have, I think, more
14 integrated planning with the NRC, to know what regulatory initiatives are coming
15 down the pipe, so that the companies can plan and execute both the NRC-
16 required things, as well as their asset management plans.

17 And I'll use an NRC example. The Office of New Reactors goes
18 out annually to ask, you know, what ESPs are going to come in, COLs, design
19 certifications, so that they can plan and budget accordingly. I think what we're
20 looking for from the NRC is something similar back to, "What are you working on
21 over the next five years?" so that the companies can plan accordingly for that.
22 So I think that's the next step beyond cumulative effects of regulation -- I think
23 the paper that was just sent to the Commission by the staff was very well written,
24 captured the meeting in November very well. Beyond that -- I know that paper's
25 focused on the rulemaking process -- I think, given this is a temporal issue,

1 cumulative effects that'll change over time, some kind of annual stakeholder
2 interaction where we can see what the NRC is working on, and you can know
3 what we're working on in our life cycle management activities, that there's better
4 integrated resource planning. And [inaudible] touched on that in his talk this
5 morning -- you know, by doing this, what are you not doing on the opportunity
6 cost?

7 Very quickly, some of our other priorities over the next five years.
8 There was a conference on long-term operation about two weeks ago. Chairman
9 Jaczko spoke at it, Brew Barron [spelled phonetically], Jeff Lyash [spelled
10 phonetically], Pete Lyons [spelled phonetically] spoke at that conference -- we'd
11 really like to establish the technical basis for -- some call it "Life Beyond 60"
12 which I support very strongly -- but long-term operation -- just like we did for the
13 current license renewal process. That work started in the 1980s, established the
14 technical basis in aging management, and we're working very closely with DOE,
15 and the Office of Research, and the Electric Power Research Institute to make
16 sure we're focused on the right things to support that process.

17 In new plant space, we want to make sure that the processes for
18 siting, licensing, and construction support timely and efficient deployment. We
19 have to make these first projects go smoothly. I think you'll see a second wave if
20 we can make these projects go smoothly. We've had great success, I think, with
21 the Office of New Reactors, in our interactions on ITAAC issues, construction
22 oversight, et cetera, so that's been very good, we're trying to plan ahead as
23 much as we can so we'll make sure that expectations are known in advance.
24 And finally, we do want to establish what it takes to license small modular
25 reactors. I think there's a lot of promise in those reactors. I mentioned the

1 activities we have underway with the Advanced Reactor Division in NRO. We'd
2 like to see that framework established so that these new designs can get through
3 the NRC process efficiently and effectively.

4 MR. LEEDS: Thank you, Tony. Chip, would you like to add?

5 MR. PARDEE: Yeah, I will. And I think what I'll add is a little bit of
6 time expanding upon the first point that Tony made, and that was on current fleet
7 safety and reliability. Tony answered the question just as I would expect him to
8 from his seat at the Nuclear Energy Institute, at NEI. There is a parallel group
9 that is consisting of, you know, the CNOs that aggregate down at INPO [spelled
10 phonetically] that have their own set of priorities that are complementary to the
11 list that Tony gave. And I'll expand just a little bit upon the fleet safety and
12 reliability initiatives that are being sponsored out of [spelled phonetically] Institute
13 of Nuclear Operations.

14 The first is really to focus on the fundamentals -- we've heard it
15 already during the RIC, but I think we have entered a period where we have
16 allowed ourselves to stray perhaps a bit from the basics of high quality
17 operations, such as quality operator rounds, control room teamwork, the basic
18 processes by which we operate our power plants 24 hours a day, seven days a
19 week. And I know that the chief nuclear officers, under the auspices of the
20 advisory group focused very hard on just quality of operations. Likewise, on the
21 quality of organizational effectiveness -- how the leadership at the station
22 functions to properly challenge the decisions that are made, the priorities that are
23 established by the station, where the resources are flowing -- that is a subject of
24 great engagement on the part of the chief nuclear officers. A couple others,
25 quality of maintenance and refurbishment activities, we talked about the

1 increasing scram rate yesterday. That is of concern to us all. And a number of
2 those scrams are somehow related to our refurbishment or repair activities. We
3 don't have the quality that we should have when we're out fixing or replacing
4 equipment in our power plants. And associated with that is the quality of the
5 repair parts that we're able to procure right now. We have too many premature
6 or infantile failures. So all those are high priority for the industry as well and
7 certainly fit under fleet safety and reliability that Tony introduced for us.

8 MR. LEEDS: Thank you, Chip. All right, Marty. From the agency
9 standpoint, what are the agency's priorities over the next five years?

10 MR. VIRGILIO: I'm really gratified to see that we all start off in the
11 same place, and that's safety. I would just add safety and security as the
12 agency's top priority, and we're going to do that through our licensing, inspection,
13 and oversight activities of the fleet. We'll analyze operating experience, both
14 domestic and international, we'll conduct research, and as appropriate, we'll
15 revise our regulatory framework -- all our guidelines and requirements in order to
16 ensure that we maintain safety and security. Going beyond that, I think there are
17 some parallels; we also see the importance in ensuring that we do timely and
18 adequate licensing decisions for the new reactors. We also see the importance
19 in resolution of key policy and technical issues associated with the new designs,
20 including small modular reactors being a priority.

21 Beyond that, I think that we need do to continue to focus on issues
22 associated with long-term storage of used fuel, and that is a priority of ours. I
23 don't want to minimize the importance of openness and public outreach, and that
24 has been a priority for the agency and it will continue to be a priority for our
25 agency. Organizational effectiveness, we look internally to see if there are

1 opportunities to improve how we manage our finances and our resources. We're
2 also looking at how we can reduce our overhead costs. Finally, I would like to
3 say that overarching this we have a number of high priority, long-standing
4 technical issues that we need to focus on and resolve. I think throughout this
5 conference you've been exposed to issues like GSI [inaudible] cooling system
6 performance, in light of the potential for debris to clog strainers in the sump
7 [spelled phonetically], containment accident pressure issues, fire protection
8 issues that transition to NFPA 805, and issues like Part 26. They're all high
9 priority, and we need to continue to focus our attention on bringing those issues
10 to closure.

11 MR. LEEDS: Thank you very much. Thank you, Marty. This next
12 question -- we heard some talk about it at this morning's plenaries, but [inaudible]
13 they can add to the question. And I'll begin with you, Marty. Is there a risk-
14 informed strategy for the agency? And what can the industry expect in the next
15 three to five years?

16 MR. VIRGILIO: A little bit of knowledge management for the staff
17 out there, and I look back to 1995 and when we were developing the PRA policy
18 statement. While we were using risk [inaudible] decision-making, I think that was
19 sort of a watershed event for the agency. And, you know, at that point in time we
20 agreed that we would use risk information in all regulatory matters to the extent
21 that it was supported by the state-of-the-art and the data, but we would not
22 compromise our deterministic approaches, such as defense-in-depth. It works in
23 conjunction with those risk-informed decisions. Shortly after that, we started
24 looking at how we could leverage risk and decision-making and formed an action
25 plan, and annually updated that action plan. But I think some of our initiatives

1 were -- I think they were very helpful, and made a difference, and others I think
2 didn't go as far as they possibly could have. I'm really encouraged by what you
3 all heard today with respect to Commissioner Apostolakis's taskforce. I expect
4 that they're going to put a new energy into the agency's use of risk information,
5 and really look forward to working with them on that project.

6 MR. LEEDS: Thank you. So, from the industry's standpoint, any
7 recommendations for the agency with regard to a risk-informing strategy? Tony?

8 MR. PIETRANGELO: Yes. I'm very familiar with the history that
9 Commissioner Magwood went through this morning on PRA policy statement,
10 and Reg Guide 1174, et cetera, and all the initiatives that came out of that. We
11 view the NRC as a global leader in the use of risk technology in the regulatory
12 framework, and a lot of good things got done as a result of that. I think, over the
13 last several years though, we've kind of leveled off in terms of our use of risk
14 insights. There was the notion this morning in the commissioners' speeches
15 about if we only had, you know, a level three PRA, we'd have everything we
16 need. We're all for quantification, but I think -- and again, I'll go back to
17 Commissioner Magwood's presentation -- there were a lot of decisions made by
18 this agency when they didn't have a lot of information and models done and
19 such. We've always wanted to focus on the risk insights, because those don't
20 change. The numbers will always change around depending on assumptions
21 made, and the more things you cover in the PRA, but the insights don't change.

22 So it's really applying those insights in a way that improves the
23 safety focus -- because that's really key -- if it can reduce unnecessary regulatory
24 burden, that would be great. I think the realization is that the plants are tuned to
25 these -- what was referred to as very stylistic design basis events that aren't very

1 likely. Is that the right tune for these machines or calibration for these machines?
2 And I think GSI-191 brought out a lot of the issues associated with trying to
3 calibrate to those very low probability events. This is a real challenge. We look
4 forward to interacting with Commissioner Apostolakis's taskforce. I think that the
5 Commission will be highly engaged. I would also recommend, and I hope he
6 makes these -- I'm sure he'll make them public -- Commissioner Ostendorff gave
7 a presentation to our Lawyers Committee on Monday on his philosophy and
8 perspectives, and it was about adequate protection, and reasonable assurance
9 of adequate protection, and how risk insights should be used there. So I think
10 this is ripe for discussion and we look forward to interacting with the Commission
11 on them -- and the staff.

12 MR. LEEDS: Great. Thank you, Tony. Chip? Anything to add?

13 MR. PARDEE: I'll take a brief diversion from the specific question,
14 and just add that we have spent a fair amount of time lately looking at regulatory
15 structures in other countries in the context of trying to learn, you know, what
16 they're doing, especially as new build programs are accelerating overseas and
17 such. And in the course of those reviews, it has become obvious that many other
18 countries don't enjoy this kind of a conversation on how we can improve risk-
19 inform regulation, what kind of changes we can make, so just simply in the
20 context that I'm very pleased to be operating in our current regulatory system,
21 and I think it's wonderful that we can continue to engage and make progress in
22 these efforts. It's a remarkable benefit as an operator to be able to participate in
23 this.

24 MR. LEEDS: Thank you for that positive feedback. Appreciate
25 that. Chip, I'm going to stick with you on this question, although this is certainly a

1 two-sided question. Both sides have a large role in it. The NRC reviews many
2 licensing actions each year, over a thousand. What efforts are underway at your
3 organization to achieve efficiencies? What can be learned from the success of
4 standardizing processes, such as the license renewal process, or the process to
5 be used with NFPA 805 submittals? What are licensees doing to improve the
6 quality of their submittals, and responsiveness to staff requests for additional
7 information?

8 MR. PARDEE: Well, to begin with, this is a subject of focus for us
9 on just plain improving the quality of the technical information and the
10 completeness of the technical information contained within the submittals. One,
11 because it's less expensive over the long haul, and two, we get our licensing
12 actions back in a much more timely fashion when we submit a quality product in
13 the first place. So, our regulatory assurance organization has a clear goal and
14 specific objectives to improve -- continue to improve the quality of the written
15 products that we submit to NRC for action. Exelon is a lot of things -- we're not
16 necessarily agile, we're not necessarily smart, but we can leverage scale better
17 than most others in the industry. And to the inference of the way you posed the
18 question, we are able to run parallel power upgrade license amendments --
19 excuse me -- likewise, license renewal applications and [unintelligible] groups
20 that do nothing but that, led by, you know, vice presidents that have their
21 dedicated staff to power upgrades or license renewals, those kinds of activities.
22 So, we do have the benefit of being able to leverage scale, and therefore
23 minimize the number of learning curves that we have to put ourselves on. So
24 that certainly helps us and helps some of the other large operators. I think we
25 just need to make sure we're continuing to try to assist to the extent that we can

1 those that don't have the benefit of economies [spelled phonetically] of scale like
2 that.

3 MR. LEEDS: Okay. Tony? Anything to add?

4 MR. PIETRANGELO: Well, I mean, we do lots of templates, and
5 we try to get with the staff in advance on any application where, if we can meet
6 NRC in the level of detail of the information that the staff needs to conduct its
7 review, then that hopefully makes the process work more effectively. So I'll
8 mention NFPA 805, we've got a template developed for that, we've got two pilots
9 that we're trying to learn from, we're going to go through that process again,
10 trying to incorporate lessons learned as we go back into the template, and back
11 into the guidance for that, hopefully to facilitate the reviews. There's a lot of
12 reviews as you know, coming up, so we want to do everything we can to try to
13 meet expectations with regard to that, and that's getting endorsed template on
14 what the NRC wants. There's nothing worse, from a licensing perspective, when
15 you don't know what the target is that you're searching for when you submit
16 something. You know, some people call that, "bring me a rock," but it's just not a
17 pleasant experience where you don't really know what you're trying to -- what
18 level of detail of information, or scope of information you need to be successful in
19 the review of the amendment request. So the extent we can get that done ahead
20 of time, and get it endorsed by the agency, I think helps all parties out.

21 MR. LEEDS: I agree. Fairly said, Tony. Thank you. So, Marty,
22 what is the staff doing to improve the quality of the requests for additional
23 information and the certainty and the predictability of the licensing process?

24 MR. VIRGILIO: Thanks, Eric. And I want to build on the points that
25 Tony was making. I've been in this job now about eight, nine months, and in

1 almost every drop-in meeting or exchange I've had with the industry, this has
2 been an issue. There's been concern about uncertainty surrounding what the
3 acceptance criteria are for some of these more significant license amendments
4 like the power uprates. And one thing that I don't think we've taken full
5 advantage of is to have these conversations and meetings -- open meetings
6 before the applications are submitted in order to make sure that we're both on
7 the same page with respect to what is the acceptance criteria for the license
8 review. In requesting a license action like this -- and it's voluntary to upgrade the
9 power of the facility -- the licensing basis, for particularly some of these older
10 plants might not be the same basis that we use for making the decisions with
11 respect to the power uprate. And for some utilities, this comes as somewhat of a
12 surprise. They would think that, well, we were licensed, we've been operating
13 this way for 20 or 30 years, why can't we use the same criteria that we used at
14 that point in time, when we received the license for the upgrade?

15 Well, things have changed, we've learned a lot through operating
16 experience and through research activities [inaudible] changed. And so I think
17 that before we start into the process of the review, or even the process of the
18 licensee really formulating the submittal, it would be to all our advantage to make
19 sure that we're clear about what is the acceptance criteria for the review. And
20 so, at the staff, I understand we've been discussing this over the last several
21 months. It's going to take a renewed initiative to try to strike up those
22 conversations in meetings, and make sure that we're on the same page with
23 respect to the quality of the submittal and the content of the submittals.

24 MR. LEEDS: Thank you, Marty. All right, let's move on to another
25 question. And Tony, I'm going to try to direct this to you, first. But you can

1 always deflect it. Question, in light of the BP oil spill, the oil industry is proposing
2 some changes in the way they do business. What lessons learned has the
3 nuclear industry and/or the NRC captured from the event?

4 MR. PIETRANGELO: We as an industry took the BP spill very,
5 very seriously, because that obviously was a place you never want to be as a
6 plant operator. And I just had those images of the flames coming off that
7 platform, and if that was at a nuclear plant, what would be the public reaction to
8 that? And it would be tough sledding for us. So, we've done a couple of things.
9 First, we looked at the interface we have, not only with the plants, but our
10 interfaces with INPO and EPRI in response to events like that. Secondly, we've
11 formed a taskforce to look at how we can leverage social media more in our
12 emergency planning and event response. We conducted a tabletop at NEI last
13 October that Sue Perkins-Grew led for us, and learned a lot of lessons from that.
14 We've going to do that on an annual basis now. This time we may actually have
15 INPO and a plant on the line when we go through that. There's obviously an
16 NRC interface -- we may be talking to you about that, do some kind of tabletop in
17 that regard.

18 But obviously, there's lessons learned for everybody from an event
19 like that. And I think the big one is you can never be complacent about safety
20 culture, the whole thing. Jim Ellis is still here, he testified before the BP
21 Commission. I think some of the recommendations coming out of that
22 commission is for the oil industry to look at an INPO-like organization for their
23 own industry. I also remember the Congressional hearing on that; you had the
24 oil executives at the table, and you know, the four others -- the non-BP guys
25 were saying, "We wouldn't do that. We wouldn't do that." And, you know, that

1 can happen anywhere. And I don't think our industry would do that, because we
2 learn lessons from each other. We're all in this together. Things do happen at
3 plants. We talked about a couple of significant events yesterday in someone's
4 [spelled phonetically] sessions. So we've got to continue to -- back to
5 fundamentals again and basics of taking OE [spelled phonetically] and applying it
6 and making sure that the probability of those things is as low as we can make
7 them.

8 MR. LEEDS: Thank you. Chip, anything to add?

9 MR. PARDEE: Only to reinforce what Tony said about the
10 importance of social media. I think the manner in which we have been trained to
11 get information out in the public in response to events such as this is frankly
12 outdated and when we think of it in the context of a joint public information center
13 and prepared press releases, they're important, but clearly if that is the
14 underpinning of our communications to the public, we'll be behind from the
15 moment the event starts and we'll never catch up. So I think for me the most
16 significant learnings and the item that will continue to be the focus force for years
17 to come will be how to best position ourselves with the Internet and other forms
18 of social media where information flows so quickly and it's so important for us to
19 be out in front of that information flow, making sure to the extent that we can, the
20 facts that we're presenting are complete and accurate.

21 MR. LEEDS: Thank you, Chip. Marty, what's the agency get out of
22 the BP oil spill?

23 MR. VIRGILIO: I think, Eric, we'll be looking at the event very
24 carefully and we're doing a case study, but for us I think it speaks to safety
25 culture and a number of issues surrounding safety culture. So we're continuing

1 to look at that, look at what we're doing today with respect to -- we have the
2 policy statement now issued on safety culture and it will inform how we go about
3 implementing changes surrounding that policy statement. I would note that
4 Department of Interior, the Minerals Management Service, now is the Bureau of
5 Ocean Energy. Those folks reached out to us early on, so we had a very open
6 exchange with that organization about how they were organized, how they --
7 what their programs for oversight of these kinds of activities, and I think that's
8 been very helpful to us too in learning about organizationally how they behaved
9 and what lessons we can learn about the oversight of these facilities and how
10 they could apply to the licensees that we oversee.

11 MR. LEEDS: Very good. Thank you, thank you. Go to our next
12 question, and Marty, I'm going to direct this one to you first. This year at the
13 Regulatory Information Conference, we had the pleasure of hearing remarks
14 from five commissioners, while last year at this time, there were only three. What
15 are some of the more noteworthy changes as a result of having a full
16 Commission?

17 MR. VIRGILIO: Thanks, Eric. From the staff's perspective, it
18 provides even more diversity of views, and I mean that in a very positive way
19 because each of the commissioners has approached the technical issues that
20 we've put before them, the policy decisions, and each one of them has come at
21 this in a slightly different way. And I find that their insights, their background and
22 experience brought to bear on these problems has been of tremendous benefit to
23 us in formulating policy and providing direction to the staff on some of these key
24 technical issues that we've talked about today.

25 MR. LEEDS: Okay, thank you. Chip, from the industry's

1 perspective?

2 MR. PARDEE: I would echo what Marty said. I think he hit the nail
3 on the head and we would share the same perspective, so I won't elaborate
4 anymore. I thought Marty answered it very completely.

5 MR. LEEDS: Great. Tony, anything?

6 MR. PIETRANGELO: Yeah, we see a lot fewer two-two votes with
7 the full Commission, that's for sure.

8 [laughter]

9 No, I think what I've noticed is the quality of the policy decision-
10 making has been up to level [spelled phonetically]. In the last several staff
11 requirements memorandums, the waste confidence, GSI-191, risk metrics for
12 new plants, mandatory hearings, work hours, et cetera. You have a very
13 thoughtful Commission; they all have different perspectives, but they all think --
14 contribute to, I think, a very high quality of thinking that goes into these decisions
15 and I think they're good decisions. And that's, you know, two heads are better
16 than one, five are better than three. And I think we're seeing that in the decision-
17 making.

18 MR. LEEDS: Thank you, thank you. The benefits of diversity,
19 diversity of thought, we get to better answers. Let me go to the next question,
20 and Chip, I'll try to direct this one to you first. In light of the recent operating
21 experience regarding tritium leaks, what measures have been taken by the
22 industry and the NRC to restore public confidence?

23 MR. PARDEE: We've spoken previously about the Ground Water
24 Protection Initiative and buried piping initiatives and such. So, I will focus my
25 answer more on the relationship portion rather than the technical initiatives that

1 we've undertaken, such as piping replacements, and more monitoring wells, and
2 things like that. What this has really brought into focus for us is the importance of
3 proactively engaging with the community and having a high degree of
4 engagement with our local stakeholders so that when situations such as this
5 occur, at least the relationships are built. There's been a lot of experience that
6 we've all had to gain around hydrology and things like that around our stations,
7 but without that proper engagement of the local communities, it's all for naught.
8 So, I would say the single biggest takeaway that we've gotten out of our lessons
9 learned surrounding tritium is the importance of having healthy relationships with
10 our stakeholders, whoever they may be. The local community, our elected
11 officials, other regulators -- for example, State Departments of Environmental
12 Protection -- folks such as that. It's so critical for us to have healthy dialogues up
13 front, such that when challenges such as this occur, we have the right basis upon
14 which to engage and solve.

15 MR. LEEDS: Thank you, Chip. Tony, anything to add?

16 MR. PIETRANGELO: Yeah, we actually did some focus group
17 testing on communicating, and we shared the results with the NRC. You know,
18 and I think, again, Commissioner Magwood mentioned it this morning. You go
19 out and talk about thousands of picocuries per liter, there's not a lot of people in
20 the public who are going to understand that. So we really need to speak plain
21 English about these things and explain them, and hopefully have the
22 relationships built where there's some credibility. And this is about public trust.
23 Really, none of these events have even had any remote impact on public health
24 and safety, so it's really about public confidence and needing to shore that up,
25 and that's a communications and relationship thing that the industry is taking

1 very, very seriously.

2 MR. LEEDS: Thank you, Tony. Marty?

3 MR. VIRGILIO: I would start by saying it's most important that the
4 individual licensees are out in front of the issues and speaking to the public about
5 this even before we start speaking to the public. That's -- once we start speaking
6 to the public, we need to do that clearly, using plain language. There's a lot of
7 lessons that were learned, I think, from the groundwater events that occurred.
8 We're going to have a session dedicated to this topic tomorrow, so I don't want to
9 go too much further and steal the thunder of the folks that will be there tomorrow
10 afternoon, but I think that pretty much summarizes the issues.

11 MR. LEEDS: Great. Thank you, Marty. The next question -- and
12 I'm going to try to direct this to Tony for the first -- as the first responder. What
13 NRC documents does the industry feel have the most value and why?

14 MR. PIETRANGELO: There's lots of NRC documents. They all
15 have great value, I think.

16 [laughter]

17 No, there are a lot of documents that have value. Let me go to kind
18 of an issue we've been talking about, which is, again, the cumulative effects and
19 the recommendations I think the staff put in its paper on draft regulatory guidance
20 coming out at the same time as draft rules, and final regulatory guidance coming
21 out at the same time as final rules. From our perspective, if we have the draft reg
22 guide that gets into the details on the how of implementation, we can improve the
23 quality of our feedback in the process to the NRC during the public comment
24 portion of the rulemaking and also be able to estimate what the burdens are with
25 that, and then that will lead to another discussion of implementation schedules, et

1 cetera.

2 I get a lot of value out of the Commission voting records,
3 personally. I think it shows the philosophy of the commissioners, and I think it -- I
4 would think it provides some insights to the staff, at least the final decision, once
5 you get through that kind of sausage-making process -- of where this
6 Commission's head is at, collectively. So, again -- and I'll give you one other
7 maybe recommendation in this regard. The staff's recommended that the draft
8 guidance and final reg guides come out in parallel with the associated
9 rulemakings. There's a near-term opportunity to walk it, which is the
10 decommissioning planning rule, which I think is slated to come out this April, but
11 the guidance isn't slated until I think the September timeframe. There's no big
12 public health and safety issue associated with that, such that the rule has to be
13 issued next month. Why can't we start implementing that process immediately?

14 MR. LEEDS: Good constructive feedback. Thank you, Tony.
15 Appreciate that. Chip, anything to add?

16 MR. PARDEE: We've been spending some time during this
17 conference talking about the principles of effective regulation. If I had to call out
18 one -- at least, one that comes to mind -- it would go back to those conversations
19 about how, you know, the basic premise -- excuse me, tenets -- of effective
20 regulation. So, I'd just call that one out again. I think it's gotten quite a bit of
21 coverage during the RIC Conference, thus far, and deservedly so.

22 MR. LEEDS: Well said. Thank you. Marty, what does the NRC
23 feel that industry has proposed to improve the speed and quality of the regulatory
24 process?

25 MR. VIRGILIO: I think Tony talked a little bit about it earlier with

1 respect to what were their initiatives to improve the quality of the licensing
2 submittals. And I encourage them to continue to work on that. As far as
3 documents were to go -- although I don't know if Jim Ellis is still here, but if I
4 think about what we're working on today, I think about the INPO documents on
5 safety culture as being very important and supportive of the work that we're doing
6 -- or complementary of the work that we're doing. If I think about the documents
7 that NEI has produced -- and I'm thinking about issues we're dealing with today --
8 the groundwater protection -- I go back to the three industry initiatives:
9 groundwater protection, buried piping, and then underground piping and tanks as
10 being very helpful in terms of promoting the kinds of operational awareness
11 around the issue of tritium leaks that I think is needed today. I also think that NEI
12 has put out some very good documents on license renewal that have been very
13 helpful to the staff. And looking forward, an issue that the Commission is
14 currently thinking about with respect to new reactor construction security -- in that
15 discussion we'd look at the NEI guidelines around that construction security issue
16 as being very helpful and complementary of what our interests are.

17 MR. LEEDS: Very good. Thank you. We've gone for a while now,
18 and I think the panelists have done a great job answering the questions that were
19 previously prepared. Now we're going to move into the phase where we're going
20 to start responding to questions from the audience. Some of these don't
21 translate to all the panelists, so I will direct them to the specific panelist that they
22 most apply to. Certainly the other panelists can chime in if they so desire. This
23 first question I'm going to direct to Marty. One of the regulatory principles of the
24 NRC and Part 52 is reliability and predictability. With a first-of-a-kind, new
25 reactor build looming, how is the agency designing its oversight and inspections

1 of construction to be reliable and predictable?

2 MR. VIRGILIO: Trying to get ahead of this, and -- it was many
3 years ago as we started into the renaissance, we started looking at what were
4 the lessons learned from the construction activities of the last major campaign.
5 And we've got -- we formed a group and started developing the Construction
6 Inspection Program. More recently, we've looked at what are the lessons
7 learned from the reactor oversight process that we applied to the operating
8 reactors to see how could we apply those lessons learned. And I think about -- if
9 the fundamentals around that program are objective, open, reliable process for
10 responding to inspection findings. And today, what we're looking at -- and we
11 actually made a recommendation to the Commission along these lines -- is to
12 take the construction oversight process and put it into that same kind of
13 framework we've established today for the reactor oversight process, using a
14 significance determination process, so that we have specific findings -- we put
15 them into the process, and you wind up with very predictable results. So those
16 are the kinds of things that we're doing today.

17 MR. LEEDS: Very good. Thank you. I don't know if industry wants
18 to --

19 MR. PIETRANGELO: Let me just echo. I think the construction
20 reactor oversight process development to this point has been excellent. The
21 cornerstones have been laid out. Recognize this is largely a communication
22 vehicle I think both to the licensee and to the public on the progress of the review
23 of that construction site. Breaking them up the way they were, I really do think
24 it's an excellent communication tool. From my perspective, it -- right now we only
25 have a couple of sites going forward, you don't have, you know, 65 sites that

1 you're looking at in an ROP. So there's less of a resource allocation function of
2 the current construction reactor oversight process because you've only got a
3 handful ongoing. And with 65 sites, there's a need to allocate those resources
4 based on the results. So really, it's the public communication piece, I think, of
5 the construction reactor oversight process that's even more important. And the
6 way it's been broken down I think is very understandable. I don't know which
7 staff member came up with the matrix for the SDP, but I think it's brilliant. I think
8 it can be done quickly and effectively. One thing we continue to concern
9 ourselves with the current ROP is the significance determination process still
10 takes a long time and a lot of resources. I don't think that was the original intent
11 at all. And I don't ever want to get into that in construction space, and I think
12 what the staff developed in that regard is very, very good.

13 MR. LEEDS: Well, thank you for the positive feedback. Appreciate
14 that, Tony. The next question is directed towards Chip. Chip, can you please
15 shed some light on what technologies are needed and used to improve the safety
16 and efficiency of outage management?

17 MR. PARDEE: We -- yeah, a couple. One is we have made great
18 strides over the past, I'll say decade in our ability to assess shutdown risk. It's
19 not as formal as operating risk, but we have made great progress in being able to
20 evaluate the efficacy of our barriers and such, and I think that focus as we build
21 our schedules on how we maintain defense-in-depth, how we can provide some
22 insight as to which are the most critical pieces of equipment to ensure is
23 available and/or operable, and how we make sure that we protect that equipment
24 has really positively impacted our risk profiles during our outages. I also think
25 that our ability to communicate between organizations during outages has

1 improved markedly. And not only does that help from an efficiency point of view,
2 but also improves our safety margins, not only nuclear safety, but also industrial
3 safety, radiation safety, and such. So while I would not say those are principally
4 gains made through improved technology, technology has clearly helped us in all
5 those arenas, and I think it will continue to.

6 MR. LEEDS: Thank you. Thank you. Any comments from the
7 other panelists? No? All right, this question is directed to you, Tony. What do
8 you see as the industry's role in interacting with Commissioner Apostolakis's task
9 group formed to consider the future of risk-informed regulation?

10 MR. PIETRANGELO: What's our role? I think to coordinate
11 industry input into that process. It remains to be seen what that is. I suspect
12 there will be a lot of public meetings in that regard. We won't be the only ones
13 inputting into the process. I'm a strong advocate of risk-informed performance-
14 based regulation. I think our industry is trying to take advantage of that to the
15 extent we can. I think there's some ripe issues for discussion and we look
16 forward to that interaction, and I hope other stakeholders chime in as well.

17 MR. LEEDS: Thank you. Any other comments? No? All right,
18 Marty, this question is directed to the NRC. The NRC staff has increasingly been
19 relying on guidance -- reg guides, ISGs, et cetera -- as a basis for expediting
20 reviews. Conversely, approaches that do not conform to NRC guidance are
21 subject to long, contentious review processes. In view of Commissioner
22 Magwood's comments on the potential for improvements to safety being stifled
23 because of the NRC's reaction to proposed changes, what can the NRC do to
24 encourage rather than discourage innovative thinking that could improve plant
25 safety?

1 MR. VIRGILIO: Let me start out by saying that the guidance
2 documents that we use, the standard review plans, the reg guides, all of that not
3 only expedite the reviews, but provide clarity around what are the acceptance
4 criteria. But it only provides one mechanism. Almost in every reg guide that I've
5 ever seen, we clearly state that this is one approach, that there are other
6 acceptable approaches to the NRC, to addressing technical issues or a license
7 amendment request. That said, once you deviate from those accepted
8 approaches, the expectation is that the applicant will provide appropriate
9 justification in order to support the deviation or the change that they're proposing
10 from the accepted approach. Oftentimes, we find that in providing some
11 alternative approach, we don't have the depth, and don't have the acceptance
12 criteria associated with the change, or the supporting rationale around the
13 change. And so, I would encourage industry that they can, in fact, deviate from
14 what might be included in the standard review plan or reg guide, but they have to
15 provide the justification. And with the justification, I don't see that the review is
16 going to take substantially longer than it would if it followed the course outlined in
17 the reg guide or standard review plan.

18 MR. LEEDS: Thank you, Marty. Tony or Chip, any comments?

19 MR. PARDEE: I don't.

20 MR. LEEDS: No?

21 MR. PIETRANGELO: If you're going to deviate, the onus is on you
22 to justify it and provide the rationale. So.

23 MR. LEEDS: Okay. Thank you. Thank you. All right Chip, this
24 question is directed to you. The proposed safety culture assessment process
25 focuses on safety culture at the plant level. Should the process also assess

1 safety culture at the corporate or fleet level? Why or why not?

2 MR. PARDEE: Well, that's an excellent question. And I would say
3 that it does in the context of the initiatives that are sponsored by INPO. We do
4 undergo corporate evaluations as well as individual plant evaluations, and clearly
5 how the corporate officers and structure function to improve safety at the power
6 plants is a key underpinning of those corporate evaluations. To the best of my
7 knowledge, the safety culture policies that have been written thus far do not talk
8 in great detail about the corporate structure that supports the power plants, and I
9 don't think that we would ever want to put ourselves in a position where safety is
10 somehow abdicated to those that are off-site. However, I do think there's a role
11 to look at safety culture in the corporate office, and I think INPO has that
12 captured with their corporate evaluations and safety culture initiatives that are
13 underway.

14 MR. LEEDS: Very good. Tony, anything? Or Marty? No? Okay,
15 the panelists have been going at it for about an hour. You guys are doing a great
16 job, but I'm going to give you a little bit of a break, because I'm going to try to
17 take this question, or at least take the NRC side of it.

18 [laughter]

19 I have to do this. Power uprates -- the question is power uprates
20 are always a challenge, can you discuss a bit on -- from the NRC side of the coin
21 as well as from the industry side? And this is an issue that I feel strongly about,
22 so I'm going to take the first crack at it. The staff's licensees have begun to bring
23 power uprates to the staff for review. The staff has approved power uprates to
24 the tune of approximately 5.8 megawatts. That's almost six nuclear power
25 plants' worth of power uprates. Last year, the staff approved eight power

1 uprates, eight power uprates in fiscal year 2010. So the staff knows how to do
2 power uprates, as well does the industry. There are two current technical issues
3 that seem to be getting in the way, for both for the regulator and for the industry.
4 The first is containment accident pressure, and licensees' use of containment
5 accident pressure. This has been a particularly difficult technical issue for the
6 staff. In a very rare instance, the staff and the ACRS -- the Advisory Committee
7 for Reactor Safety had disagreed on the technical outcome of this issue, and the
8 staff prepared a paper, which we recently sent to the Commission and the
9 Commission is currently voting on. So the staff has taken on that technical issue
10 and we think we have a path forward. We'll certainly get a path forward from the
11 Commission.

12 The other technical issue that's been troublesome has been the
13 issue for BWR steam dryers -- the steam dryer vibration issue. This is an issue
14 that I'd really like to see the BWR owners group and industry really take on
15 strongly. The staff has approved uprates for certain BWR plants --
16 Susquehanna, Oak Creek come to mind -- it seems curious to the staff that for
17 each one of these BWR power uprates, we're seeing different types of analysis,
18 different ways that licensees are trying to attack this issue with steam dryer
19 vibration. So we're really looking for an industry-led resolution to that issue.
20 Going forward, I know that Marty has talked a bit about this issue in his response
21 on licensing, the use of pre-application meetings, the idea of changing the
22 current licensing basis. And I agree with Marty, and I would like to ask all
23 licensees, when you're planning to do an extended power uprate, obviously
24 you're spending hundreds of millions of dollars to do that. Factor in the
25 regulatory review while you're preparing your equipment and your design

1 engineering review. You know, get us on board early. We do not want to be on
2 your critical path. Come meet with the staff in pre-application meetings; let's
3 discuss the tough issues before you submit the application.

4 Let me pass it over to Chip or Tony.

5 MR. PARDEE: You know, obviously, we share your concern with
6 the containment overpressure analysis and what the clear path is with that. And
7 also, you know, having the poster child for steam dryer issues at Quad Cities, I,
8 you know -- and what we had to go through to develop the analytical tools
9 required to one, ascertain what the loading was on the steam dryers, and two,
10 how to reduce that loading. You know, I surely understand how that can be
11 frustrating, if it appears that you're seeing a number of different tools. I'm aware
12 of a couple -- I did not know that the extended power uprates that you're seeing
13 appear so diverse in their approach to steam dryer mechanical loading and such
14 -- I was just simply unaware. It seems to me the BWR owners group is the
15 logical place to fix that. I know there are a couple of companies out there that
16 have been investing heavily in developing the technology to create those
17 analytical tools. I would have told you there was consensus on pathway there -- I
18 could be wrong, but that's something that we'll take a look at as the industry
19 goes.

20 We at Exelon, we've completed pushing 1,200 megawatts' worth of
21 power uprates over the last decade, or decade and a half. And when it became
22 clear to us that the -- financially, the economic conditions for our new build down
23 at Victoria in Texas was not going to support full speed ahead, we focused on a
24 power uprate program that's -- we've embarked upon now that adds about 1,400
25 megawatts of capacity across our fleet of 17. So, we have a sizeable program

1 underway right now. We certainly agree with you, and it is in keeping with some
2 of our previous comments about getting the quality built into the application first
3 is the best way to complete these in a predictable manner.

4 I will say that there are a number of products out there that
5 specifically address the lessons learned during previous power uprates that the
6 industry is using as we continue to pursue additional power uprates in the future,
7 and those tools have proven to be very, very effective thus far. So the industry is
8 rallied around trying to improve the quality of not only the license amendments
9 that we're submitting in support of these power uprates, but just as importantly,
10 the plant reliability concerns that some of the power uprates have precipitated,
11 because we weren't focused clearly enough on margin management associated
12 with the power uprates, making sure that we weren't focusing simply on the
13 reactor core as opposed to margins and balance of plant systems and such. All
14 those lessons learned have been captured, the industry is using those, we
15 continue to build upon them, and I think we're on the right pathway right now, I
16 do. That's not to say that we have learned all of our tough lessons yet, but I think
17 it's a much more coordinated effort today than it was even three or four years
18 ago.

19 MR. LEEDS: Thank you for that perspective, Chip. Appreciate it.
20 Tony, did you want to -- anything? Okay, thank you. Going forward, this
21 question is directed to you, Chip. What is your opinion of the viability of small
22 modular reactors as a merchant operation? Let me leave it at that.

23 MR. PARDEE: Okay. Well, once mature, I see no reason why
24 merchant operations will have a markedly different approach to small modular
25 reactors. I don't anticipate domestic merchant -- the domestic merchant

1 marketplace being the first application of. I just think there's too many lessons
2 learned that we haven't gleaned yet to make the kinds of decisions to invest, you
3 know, \$1 billion plus, without having a proven product and a clear licensing path.
4 I think the viability of small modular reactors will be set by the licensing and
5 regulatory framework, and particularly as plant staff sizes are determined. I am a
6 big proponent of small modular reactors, but the economics haven't panned out
7 yet, and we won't see that until it's clear to us what we require from the security
8 workforce, what kind of emergency planning regulations are in place -- not
9 necessarily less restrictive, but different ways to accomplish the same end of
10 providing adequate public safety as part of our emergency preparedness
11 program. So I think we have a lot of work to do, but I am very optimistic that this
12 can be a viable technology force going forward. And I think it will be -- it has the
13 potential to be economic, as well.

14 MR. LEEDS: Thank you, Chip. Certainly there are a number of
15 policy issues. Marty or Tony, did you want to add anything?

16 MR. PIETRANGELO: I talked about it before. We're engaged with
17 the Advanced Reactor Division in NRO on a number of generic issues, and the
18 sooner we can get those resolved and understood, I think, then the information
19 that companies like Exelon and others need to decide whether they want to go
20 forward with a small modular reactor will come out of that.

21 MR. VIRGILIO: Eric, before you go on, I just want to note that while
22 these lights are bright, it's hard to see the audience. I do have a line of sight to
23 Brian Sheron, and I was watching him fill out a question card for you, so be
24 careful.

25 [laughter]

1 MR. LEEDS: I can tell his handwriting, Marty, I already threw that
2 one away.

3 [laughter]

4 MR. LEEDS: Hey, Brian.

5 [laughter]

6 Moving right along, the next question I'm going to direct to Chip or
7 Tony. How would you envision safety-security interface communications
8 between NEI and INPO to enhance the overall public safety?

9 MALE SPEAKER: Why don't you go this time, Tony?

10 MR. PIETRANGELO: INPO traditionally has not been involved in
11 security in their evaluation visits at plants. So that has not been the history. And
12 I think they are looking at cyber security now because that's obviously something
13 we have to pay attention to, how they can help us in that regard in terms of
14 assessing the implementation of our cyber security strategies. But physical
15 security has not been part of the INPO evaluation process.

16 MR. LEEDS: Thank you for that clarification, Tony.

17 MR. PARDEE: What INPO has focused on recently is emergency
18 preparedness and the veracity of our emergency preparedness programs and, as
19 we all know, a clear nexus between emergency preparedness and our security
20 posture. Not necessarily physical security meaning guns and security officers,
21 but our ability to respond to any kind of event is obviously integral to emergency
22 preparedness. And INPO is sharply focused on emergency preparedness at this
23 time. And I think that the coordination between NEI and INPO is healthy in this
24 area. I see lots of dialogue, lots of mutual problem resolution, and such. So I
25 think the industry is properly engaged.

1 MR. LEEDS: Very good. Very good. Thank you. Thank you for
2 that. Okay, here's a question that could pertain to all panelists, so let me throw it
3 out and then we'll go through. What do you see as the major unanswered
4 questions for life after 60 that are not currently being addressed by the aging
5 management programs for the 40- to 60-year timeframe? Chip, do you want to --

6 MR. PARDEE: I think -- and I'll ask Tony just to elaborate on,
7 certainly, on industry position -- I do think that 40 to 60 and 60 to 80 are two
8 different questions. Now, maybe 40 years ago I wouldn't have viewed it that
9 way, but, you know, clearly we have a current view of the health of our power
10 plants at 40 years -- we have one that's pushing 42 years old right now -- and
11 from a safety and reliability point of view, it certainly presents its challenges, but
12 we're clearly able to keep up with them. I think the plant is more safe today,
13 more reliable today than it was when it was first put into operation. With that
14 said, we are finding that we are spending more and more money and resources
15 on maintaining passive equipment, things that you don't typically think about like
16 concrete at intake structures, and containment liners, if they haven't been
17 properly maintained over the years. We've spent a lot of time talking about
18 buried pipe and submerged cables, which are typically a larger challenge -- a
19 greater challenge -- at the older vintage power plants. So I do think being able to
20 confidently say that we are not -- those unknown unknowns associated with
21 aging equipment and aging materials -- I think answering those questions will be
22 tougher for the 60 to 80 year period.

23 MR. PIETRANGELO: I don't have anything to add to that.

24 MR. LEEDS: Marty?

25 MR. VIRGILIO: No, I agree.

1 MR. LEEDS: Yeah. Well said. Thank you, Chip. This is another
2 question that all three panelists can answer. Developing new rules and
3 regulations is a lengthy process -- some have suggested that the industry should
4 being implementation before the new rule or regulation is finalized in order to
5 assure timely compliance. Please comment.

6 MR. PARDEE: I'll start.

7 [laughter]

8 MR. PARDEE: Sorry, Tony.

9 MR. PIETRANGELO: Go ahead.

10 MR. LEEDS: Well, that got Tony excited.

11 MR. PIETRANGELO: [laughs]

12 MR. PARDEE: While I guess superficially, I understand the basis
13 of the question, when we don't know -- we talked about this already -- when we
14 don't know what the desired end state is, it is hugely costly to try to guess up
15 front. And I know this very, very painfully by the security orders that were issued
16 in the subsequent rulemaking around that. I understand why it was important --
17 I'm not up here saying that I think that that was a mistake -- it's very important to
18 us and it's crystal clear in retrospect how important it is that we can be confident
19 in saying that our facilities are secure, but we wasted tens of millions of dollars
20 trying to guess what the end state was going to be and expediting physical work
21 to get there. So, I think, if anything, we should look at the implementation period.
22 We're doing this now with multiple spurious operations because of our refueling
23 outage cycles and such, you know, you only shut a unit down once every two
24 years. Some of these modifications are extensive. We are having to expedite
25 not only the design and engineering work, but the procurement activities. It's just

1 not the right way to run a railroad. So to the extent that we can get ahead of it,
2 we will. But the right answer is not just blindly investing and thinking you're going
3 to know what the desired end state is.

4 MR. LEEDS: Thank you, Chip. Tony?

5 MR. PIETRANGELO: I actually interpret that question a little bit
6 differently in terms of -- and maybe I'm looking at this through rose-colored
7 glasses -- the value of piloting something before it goes out to the entire industry.
8 I think we've got countless examples of things that were piloted at one or more
9 plants, work out the bugs, incorporate the lessons learned from it, develop
10 durable guidance, and then go out for full implementation. I think we've proven
11 that that works very, very well. You can't use that approach in every
12 circumstance, obviously, but when you can, you should.

13 MR. LEEDS: Thank you.

14 MR. PARDEE: I agree with Tony. And I don't know how to
15 interpret the question, and perhaps was a little hair trigger [spelled phonetically]
16 on that one.

17 MR. LEEDS: No, I thought that was a good --

18 [laughter]

19 MR. LEEDS: Chip, I thought that was a good answer, appropriate.
20 And Tony also. Marty, anything to add?

21 MR. VIRGILIO: Well, there are certain situations where I think
22 industry getting out in front of the NRC has worked very well, and I'd say the
23 groundwater initiative is another example I would point to where, as a result of
24 the activities that they are undertaking under three NEI initiatives -- the
25 groundwater protection, buried piping, and the underground piping and tanks --

1 you look at that when it's all said and done, and it's very difficult for us to justify
2 developing a regulatory requirement that would address that issue the way it has
3 been driven when we look at it based on safety significance and risk.

4 MR. PARDEE: I agree with you, Marty, but -- we may be out in
5 front of NRC on some of that, but we're not out in front of all of our stakeholders.
6 We're reacting to groundwater because we're getting driven by either public
7 confidence issues, or other regulators, so we shouldn't be patting ourselves on
8 the back too hard for that one. I do agree with your premise, though, the extent
9 to which we can be ahead of things and help inform the direction that we're going
10 to take, including the requisite regulation, that's clearly the direction that we
11 should be heading in.

12 MR. LEEDS: Very good. Very good. Since the question was so
13 open-ended, I'm going to jump in again and add two cents. One of the initiatives
14 that the staff took in response to the Commission's SRM and direction to take a
15 look at cumulative effects of regulation, was we used the emergency
16 preparedness -- the current rulemaking going on in emergency preparedness --
17 as a test bed for discussions with the industry and affected stakeholders, with
18 regard to implementation dates for the 11-some odd issues that are covered in
19 the emergency preparedness rulemaking. The feedback that we got from the
20 industry, from FEMA, from the states, and from the public, was invaluable to the
21 staff to understand some of the limitations and some of the things that the
22 stakeholders would have to go through in order to implement various aspects of
23 that rulemaking. And so we've incorporated the lessons learned from that in our
24 paper that we sent to the Commission on ways to go forward with rulemaking
25 such that we can have implementation dates that make sense for all of our

1 stakeholders, that are doable, rational, and that we can go forward on. And it
2 was interesting; the industry actually came back and proposed some dates that
3 were faster than the staff had anticipated. So, the dialogue, I think in this case,
4 has really been beneficial.

5 MALE SPEAKER: I agree.

6 MR. LEEDS: We have time for a couple more questions. Thank
7 you all for hanging in there. We've been going for a while. Currently -- and this
8 is addressed to all -- currently, operating reactors experienced early challenges
9 when they first entered operation before developing their stronger safety record
10 over the last couple of decades. Do you anticipate similar growing pains for new
11 reactors? Tony?

12 MR. PIETRANGELO: Yes. You know, a lot of people, let me -- I'll
13 digress a little bit here. A lot of people think the nuclear renaissance started
14 around mid-2005 or 2006, there with the Energy Policy Act of 2005, and a lot of
15 COLs, and new design certifications, et cetera. We think the renaissance
16 actually began in the early '90s, when -- and the premise of that question was --
17 you had a lot of events at plants, you had low capacity factors -- where the
18 industry basically went from 70 percent average capacity factor to 90 percent in
19 2000. That was the true renaissance. And there's a lot of people who can take
20 credit for that, first and foremost, the plant operators and personnel who work
21 every day at the plant. The NRC can take credit for it, INPO can take credit for it,
22 and we've been able to sustain that performance now for a decade.

23 But as part of our -- and I'll call it a campaign on realistic
24 expectations for new plants, there's no perfect construction project. There will be
25 bumps in the road. There will be startup issues associated. These are first-of-a-

1 kind plants, okay? So we have to, I think, to be very realistic about the
2 expectations of operations for these new plants. They're not going to come out
3 of a chute operating at 98 percent capacity factors. There will be operating
4 experience that has to be gleaned -- we're good at it as an industry, we know
5 how to do it. But again, what -- we'll be very vocal about realistic expectations,
6 both with a construction project and a plant -- a first-of-a-kind plant.

7 MR. PARDEE: I agree with Tony. With that said, and we have
8 discussed it earlier, and you can view it as a blessing or a problem, but we will
9 have the advantage of seeing these new designs go in service elsewhere. So
10 Southern, Scana [spelled phonetically], those that are contemplating AP1000
11 builds, are deeply engaged with the Chinese at Sanmen, for example, learning
12 their construction, and will learn their operational -- you know, early lessons
13 learned. So, I do agree with Tony in the context that there's teething pains
14 associated with these things, but we are going to have operating experience that
15 we'll be able to clearly apply on our first domestic new unit startups based on
16 what's happening internationally.

17 MR. LEEDS: Very good. Thank you both. Marty, anything?

18 MR. VIRGILIO: I'm going to take a slightly different view. From a
19 safety perspective, I am not only optimistic, but confident that we're not going to
20 start off in the same place we started off with the last generation of reactors. I
21 can recall having seven major plant upsets per year, per reactor. Seven trips per
22 year, per reactor when we were in the late '70s and early '80s. I don't expect that
23 we're going to see that kind of operating performance from the plants -- from a
24 safety perspective, from this new generation of plants. They come at this with a
25 much lower risk profile, which I think helps us, and I know that we're going to

1 leverage in not only the lessons learned from international operating experience,
2 but the lessons learned from the experience here domestically. So I expect that
3 we're not going to see the kind of safety or reduction in safety margins with the
4 startup of this generation of reactors that we had with the last generation.

5 MR. PARDEE: I think that's right, Marty. And I also think that
6 clearly our expectations are much, much higher this time around.

7 MR. LEEDS: Very good. Very good answers. Thank you all. All
8 right, last question for the panelists. And I'm going to direct this over to Chip and
9 Tony. What is industry doing to get ahead of the coming challenge of counterfeit,
10 suspect, and fraudulent items that could enter the procurement chain and affect
11 safety of the new and operating reactors?

12 MR. PIETRANGELO: Well, fortunately, or unfortunately, we've
13 seen this movie before. In the late '80S, there were a number of items of
14 counterfeit or substandard parts, you've got a nuclear utility procurement group
15 now that does vendor audits and shares the results across the industry. We
16 know the vendor inspection portion of the NRC is not only domestic, but
17 international now. So we've got to constantly be on the watch for that. And no
18 one wants to install counterfeit or substandard parts in their plants. You
19 mentioned procurement being a challenge on replacement parts now, so I think
20 we're ready for it. But it'll be a challenge.

21 MR. PARDEE: Well said, Tony.

22 MR. LEEDS: Marty, anything to add?

23 MR. VIRGILIO: No.

24 MR. LEEDS: All right, folks, I think this concludes our panel
25 session. Please, a round of applause for our panelists.

1 [applause]

2 MR. LEEDS: Thank you all for your very insightful questions, and
3 all the technical sessions will reconvene at 1:30. Please enjoy your lunch.

4 [Whereupon, the proceedings were concluded]